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**Does countries'
corporate income
tax policy affect
foreign subsidiaries
financing
decisions?**

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Table of Contents

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I.   Introduction

The quantity of leverage firms have in their capital structure may have considerable implications that extend way beyond their effect on shareholders' and firm's value (Auerbach; 2002). Excessive levels of indebtedness in the private sector have in fact been recognised as a considerable concern for financial and macroeconomic stability (European Commission; 2016 and International Monetary Fund; 2016). High levels of debt have been doubtlessly identified as one of the contributing factors not only to the origination of the global financial crisis but, also, of its protracted effect (International Monetary Fund; 2016). An ingredient that surely had a hand in the build-up of excessive leverage in the period leading up to the crisis is to be found in the asymmetric tax treatment granted to debt and equity in most of the tax systems (Cottarelli; 2009). The widespread deductibility of interest expenses from the tax base generates to main adverse effects – the creation of a debt bias and the generation of considerable debt shifting and tax minimizing opportunities for multinationals to take advantage of (European Commission; 2016).

With the objective of addressing these two issues several jurisdictions reformed their tax system over the years. The boldest few introduced more "radical" changes, such as the introduction of an allowance for corporate equity, while the majority resorted to less cumbersome ways to address the matters. In particular, they decided to introduce thin capitalisation rules or other limitations to the deductibility of interest expenses (Buettner et al; 2012). Despite being quite widespread across different countries, only few studies actually analyse the effects of such rules on the capital structure decision of corporations (International Monetary Fund; 2016).

Within this context, the purpose of the quantitative analysis presented in this thesis is that of investigating the impact of cross-country differences in corporate income taxes and in the presence of thin capitalisation (fixed debt-equity) rules on the leverage of Italian subsidiaries. As such, this work contributes to the existing literature in the following main ways. Firstly, it extends the existing literature on the effect of cross-country CIT rates on the capital structure choices of multinational groups. In fact, regardless of the rich publications on the topic, the work on Miniaci et al. (2011) has demonstrated that there is still a lot that is not known about the dynamics driving the financing behaviours of MNCs. Further, by also looking at the impacts exercised by the presence of thin capitalisation rules in the home

country on the affiliate's leverage, it endeavours to contribute to improving the understanding of how these measures affect the division of debt in multinational groups.

The empirical investigation employs micro-level panel data obtained from ORBIS for the period 2013-2020. The information about the firm specific characteristics of the Italian affiliates are then complemented by country specific data that comes from a variety of sources. These include the World Bank's World Development Indicators and the tax guides or summaries developed by professional service networks among others.

The estimation is carried out by means of ordinary least squares approach and produces the following findings. Focusing on the Debt Ratio definition of leverage – the one most widely employed in the relevant literature – changes in home country corporate income tax rates are always found not to affect affiliates capital structure in a significant way. Conversely, the thin capitalisation dummy and the interaction term are often found to affect subsidiary's indebtedness in a negative and positive way respectively, and sometimes such an impact is also significant. This suggest that it cannot be ruled that the presence of thin capitalisation rules, everything else being equal, reduces not only parent company indebtedness but, also, that of the affiliate through reductions in the use of internal debt that are not perfectly substituted for by the use of external debt. Similarly, the interaction between thin capitalisation rules and the CIT rate suggests that, even when the corporate income tax rate is increased, it is more attractive for the group to leverage up in the affiliate rather than in the parent company.

The thesis is organised as follows. Chapter 2 reviews the main capital structure theories and illustrates the importance of studying firms' leverage. Chapter 3 presents the main alternative ways to address the debt bias and illustrates some of the feature of the Italian tax system that may affect the affiliates in the sample. Chapter 4 describes the research question, the sample, the data and the model. Chapter 5 reports the results of the estimation procedure. Chapter 6 briefly reviews the main findings obtained from the description presented in the previous chapter for both tax related and firm specific variables. Lastly, Chapter 7 concludes.

I. Why does Leverage Matter?

1. How is the Corporate Capital Structure Determined?

Financial leverage represents the part of capital that is financed by debt rather than equity (Ward and Price; 2015). In other words, it "is the use of borrowed money (debt) to finance the purchase of assets with the expectation that income or capital gain from the new asset will exceed the cost of borrowing" (Corporate Finance Institute[1]; 2022).

The starting point of any discussion about the economic relevance of this measure must be a brief review of the theory of capital structure determinants. In fact, one of the most important decisions faced by a firm is how to finance itself. In a simple framework, the determination of the capital structure is the result of two main choices: i) the amount of earnings to retain for the purpose of internal financing and, ii) the appropriate mix of external financing (equity and debt) to employ in the capital structure (Auerbach; 2002). In a world of perfect and frictionless markets with no informational asymmetries and no taxes (or a tax system that is neutral), such as that detailed by Modigliani and Miller (1958 and 1963) in their seminal work, these decisions do not matter. No mean of financing is better than another and consequently the choice of the capital structure has no effect on shareholders' and firm's value.

However, when the restrictive assumptions underlying this theory are relaxed, how a firm decides to finance itself does matter and could have considerable implication for both the value of the entity and the health of the economy (ECB; 2013). The acknowledgement of this fact spurred the two authors to correct their initial observation by recognising that, while it is true that under very restrictive assumptions the capital structure decisions do not impact the value of an entity, in the imperfect world we live in these factors do matter. As such, when taxes are introduced, the following two phenomena are observed. Firstly, due to the existence of the tax shield of debt (because of the deductibility of interests), there exists an inverse relationship between the weighted average cost of capital of a firm and its indebtedness. Conversely, equity becomes more costly as leverage is increased because of the increased risk of financial distress that is borne, although to a limited degree also by shareholders (Miller and Modigliani; 1963).

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[1] The definition is available at this link:
https://corporatefinanceinstitute.com/resources/knowledge/finance/financial-leverage/

Considering the relevance of the topic to the understanding of the behaviour of enterprises, over the years a number of competing explanations have tried to provide new contributions to understand the factors determining capital structure decisions. Several theories have emerged trying to tackle and explain the issue by concentrating their attention to the different kinds of market imperfections that may influence the financing decision of a company (Jou and Lee; 2004). Jou and Lee (2004), in their investigation of capital structure determinants, identify four main frictions that may influence corporations' choice of their preferred mean of financing: i) the deductibility of interest expenses, ii) conflicts of interest between equity and bond holders, iii) the existence of bankruptcy costs, and iv) the purchase and sale value of capital. Since no consensus on the theory that best explains capital structure decisions, those that are most widely studied are briefly reviewed below.

The **trade-off theory** was developed in 1973 by Kraus and Litzenberger and assumes that there exists an optimal capital structure for the firm. Th optimal mix of debt and equity is ultimately determined by two factor – taxation and the risk of financial distress. As such, the firm will pick a level of leverage that maximises the benefits arising from the tax shield of debt such that these just offset the cost of financial distress (ECB; 2013 and Kühnhausen et al.; 2014). This theory is the one that most explicitly analyses the role of taxation. In fact, it clearly recognises that it is the differing treatment between equity and debt that ultimately determines the amount of leverage held by a corporation (Fatica et al.; 2012). This is because debt financing, through the deductibility of interest payments, is favoured to equity in most jurisdiction. The existence of this debt bias implies that, were it not for bankruptcy costs, a company could in theory decide to only rely on debt financing (Fatica et al.; 2012).

Conversely, in the **pecking order theory**[2] (Myers and Majluf; 1984) the capital structure choice is influenced by the existence informational asymmetries. The presence of asymmetric information in turn causes conflict of interests between managers, that have by definition a better knowledge about the value of the firms' equity and debt, and the outside - shareholders and bondholders (Frova and Hillier et al.; 2018). The main idea behind the theory is that managers will use external finance when they know that their debt or equity is overvalued,

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[2] Depending on the study under examination, the agency cost theory might be considered separately to the pecking order theory (as is Frielinghaus et al; 2005) or as one of the alternative interpretations given to the theory. In this case, while being presented in the same paragraph for ease of explanation, it is important to keep in mind that they have very different implication for the composition of the capital structure.

and this mechanism is known to outsiders. As such, managers will first rely on internal financing in order to avoid facing issues related to the demand for a higher return that external financing would command due to increased risk (Frova and Hillier et al.; 2018). Conversely, if the company must resort to external financing, following the same rationale the safest security - debt - should come first. As such, this agency problem ultimately results in a hierarchical organisation of the different means of financing (Frova and Hillier et al.; 2018).

However, some (like Easterbrook; 1984 and Jensen; 1986) contend this theory and present another alternative interpretation under the name of **agency cost theory**. This observes that managers may squander the free cash flow to their own benefits rather than on worthwhile projects. This implies that shareholders should theoretically favour debt over internal financing because it limits managers' discretion in the use of funds therefore protecting the interests of shareholders (aus dem Moore; 2014). Similarly, another version of the agency cost theory envisages a conflict between shareholders and debtholders. In this case the first have incentives to convince the management to use debt financing, rather than equity or internal financing, because it shifts the cost of bankruptcy onto the lenders (de Mooij; 2011a). Generally, the pecking order theory implies that there is no such thing as an optimal level of leverage, the proportion of debt in the capital structure is then determined only by financing needs (Frova and Hillier et al.; 2018). Additionally, it also implies that firms that are larger and more profitable will be able to generate more internal financing and thus rely less on debt (Frova and Hillier et al.; 2018). Conversely, the agency cost theory implies that the capital structure of the firm is ultimately determined by conflict of interests and the desire to limit them through the use of debt (aus dem Moore; 2014).

Also stemming from asymmetric information and resulting is a hierarchical organisation of the different sources of finances is the **signalling theory** (or information asymmetry theory). Developed in the 70s by Ross (1977) and others, the signalling theory relaxes another assumption of Miller and Modigliani's invariance theorem, the one where "the market possesses full information about the activities of firms" (Ross; 1977). The theory thus suggests that the organising principle is not be found in agency problems but on the signals that a specific choice sends to the outside (aus dem Moore; 2014). Similarly, to the pecking order theory this has also to do with managers having more information that investors, but differently from it they do not want to deceive shareholders and bondholders anymore. Rather managers now wish to convey or signal what they know about the future prospects

of the firm to the outside (Markopoulou and Papadopoulos; 2009). This cannot be done by simply communicating the good news, Bhattacharya and Dittmar (2004), since in the eye of investors costly and costless signals have a very different value. In fact, any firm could make an announcement without it being truthful, however only companies that are really confident about their future prospects would adopt a financial policy reflective of these opportunities (Markopoulou and Papadopoulos; 2009). As such, retained earnings is favoured to debt because it communicates that the firm has no need for external financing. Conversely, debt is, on the other hand, favoured to equity since issuing new shares warns shareholders that the firm has exhausted its debt capacity (ECB; 2013 and Kühnhausen et al.; 2014). Further, since debt through interests constitutes a commitment for the firm, issuing it might also signal that the company is confident that it will be able to service its obligations, and should therefore be considered more positively than equity (Markopoulou and Papadopoulos; 2009). However, the interpretation of the signal sent by debt is not always so clear cut. As noticed by Myers (1984), issuing additional debt might also send a negative signal as it increases the likelihood that the firm will face liquidity issue and the probability of bankruptcy. Fama and French (1988) also agree with this observation and suggest that generally more established firms, that are larger in size and more profitable, actually have lower level of leverage.

Lastly, another relevant that received little theoretical and empirical investigation is the **life cycle** (or stage) **theory**, that combines capital structure and organisational life stages theories. This posits that the amount of debt a firm uses in its capital structure should increase over time as the company "matures" (Frielinghaus et al.; 2005). Both Hovakimian et al. (2001) and Bender and Ward (2009) seem to confirm this observation. The firsts note that, growth opportunities should be financed by equity while assets already in place by debt. This implies that a young high-growth firm should finance itself primarily using equity, but as it matures it should favour the use of debt (Hovakimian et al.; 2001). Similarly, Bender and Ward (2009) clearly state that the financing needs of a company are not crystallised, but that they evolve together with the firm. Further, they explain that there exists a trade-off between business and financial risk. The first in fact, falls as the firm grow over time while the second increases (Bender and Ward; 2003). As such, to summarise, firm in earlier stages of their life are more likely to use stock markets to finance themselves because they require a lot of capital to grow and, due to their considerable riskiness, they are unlikely to be able to obtain it from lenders.

As firms grow and become more established, they should become progressively less risky and thus struggle much less to obtain capital in the form of debt (Frielinghaus et al.; 2005).

In 1984 Bradley, Jarrel and Kim wrote that "One of the most contentious issues in the theory of finance during the past quarter of century has been the theory of capital structure". Almost forty years have passed since then and nothing has really changed in this regard as there is still a general lack of consensus about what really determines capital structure decisions (Frielinghaus; 2005). However, as exemplified above, there are abundant alternatives that try to tackle embedded in the title of this chapter. The trade-off theory, for instance, contends that there exists an optimal capital structure that may be obtained by weighting the benefits of the tax shield of debt against the cost of financial distress. This implies that the optimal capital structure is ultimately determined by a decision about how much leverage to hold. The pecking order and the signalling theory, on the other hand, argue that there is no such thing as an optimal capital structure and a target level of debt. In fact, they posit that it is the financing needs that determine how the company choses to finance itself. Both theories find the existence of hierarchy of financing needs - captained by retained earnings and followed by debt and equity in this order – but they disagreed the exact causes of such an organisation. Ultimately, while agreeing that there is no optimal capital structure, the life cycle theory suggest that in actuality what determines the capital structure of the firm at any point it time is the life stage in which the company find itself. This means that different stages will require different means of financing.

The summary provided above clearly highlight the lack of agreement among scholars about what exactly determines the capital structure. This is further reinforce by the fact that, even when competing theories agree that a certain factor matters for firm financing decisions (such as profitability for instance), they often end up disagreeing about whether the effect exerted on leverage is positive or negative. In this respect empirical studies have not been able to shed light on the matter. For instance, the study of Kayhan and Titman (2007) appear to confirm the static trade-off theory by observing that, in the longer period, firms seem to target a certain specific debt ratio. Conversely, Degryse et al. (2012), in their investigation of the behaviour of Dutch SMEs, find that their evidence is consistent with the pecking order theory rather than with the trade-off theory. Concerning the pecking order theory, at least for the United States (as noted by Frank and Goyal;, 2007), there seem to be little evidence of it in the period following the 1990. In this respect, Fama and French (2002), observing

the capital structure decision of a sample of firms, find that most companies actually issue equity much more often that would be implied by the pecking order. These few examples clearly show that, regardless of the theory considered, the evidence is always rather mixed and nowadays there is still no consensus on which one of the proposed theories betters explains firms' financing decisions (Kühnhausen et al.; 2014).

As such, at the present time capital structure theories fail to provide adequate guidance on what exactly it is that determine capital structure decisions and are also not particularly helpful in understanding how much leverage is too much. This is particularly troubling considering the role played by leverage in the financial crisis and the existence in almost all countries of debt bias that further favour firms' indebtedness (aus dem Moore; 2014). There appears to be "no universal theory of the debt-equity choice and no reason to expect one" (Myers; 2001).

2. Why is Leverage Important?

Having better clarified the theoretical background and the role of leverage in capital structure theories, the attention may be brought back to the topic of this chapter: why does leverage matter?

As already mentioned in the previous section, leverage matters because its proportion with respect to that in other means of financing determines the cost of capital faced by an entity and, consequently, firm's and shareholders' value (Auerbach; 2001). However, the implication of deciding how much debt to hold extends way beyond the firm-level and can have considerable macroeconomic implications. In particular, there exists a positive relationship between the amount of debt held by an entity and financial distress. This implies that as leverage increases the firm becomes more and more sensible to adverse events (such as a trend of decreasing sales in the industry or rising interests) and, as a result, may struggle to service its obligations (Cecchetti et al.; 2011). Further if an economic downturn were to take place, a highly levered firm may have to take more drastic changes to investment, production and employment than a comparable firm with lower indebtedness in order not to fall short on debt repayment. It is easy to see then how this may turn in an issue for the broader economy and eventually the financial system if firms fail to service their debt (Bernanke and Campbell; 1988). Even in absence of a slowdown in the economy, too high leverage may constrain firms' ability undertake positive net present value projects. Reduced investment, if widespread, could eventually feedback on economy growth in a negative way (ECB; 2013).

Within this context, another factor that could negatively affect financial and economic stability through leverage is the existence of a debt bias. Most countries in the world, in fact, have a tax system that allow for the deduction of interest expenses from the imposable corporate income tax base while at the same time not allowing the same treatment to equity (Huizinga et al.; 2006). This implies that when deciding to finance an investment using equity a firm must ensure that its pre-tax return is much higher than that that would be required using debt. "[…] this means that if the investing company has an alternative safe investment that earns 5%, the investment financed by debt would need a pre-tax return of only 4%, while equity needs to earn 6.1%"[3] (European Commission; 2016).

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[3] These estimations are developed by the European Commission (2016). The model is explained in Annex X of the same work.

The debt bias has considerable implications. Focusing on the non-financial sector, the preferential tax treatment of debt has been found to encourage firms to use more leverage than they otherwise would and to rely more on it than on equity (Cottarelli; 2009 and European Commission; 2016). Empirical works provide ample evidence of this phenomena. For example, de Mooij (2011) notes an increase of 1.7 to 2.8 percentage points in the debt-to-asset ratio as a result of 10 percentage point increase in CIT rate.

A similar result (although of a different magnitude) is found by Feld et al. (2013). The authors predict in their meta-analysis of 48 studies the impact of the marginal corporate income tax rate on the debt-to-asset ratio to be about 0.27. Increased indebtedness in non-financial corporations makes them less resilient to external shocks increasing the bankruptcy likelihood and constraining liquidity, this is why "excessive private sector debt can be seen as a systemic credit externality" (Bianchi; 2011).

This micro-level issue may generate spill-overs to both the financial sector and the real economy. Concerning the first, rising likelihood of financial distress and default may in turn increase the number of non-performing loans held by financial entities with consequences that can be more or less dire depending on the tax treatment of bad debts and deferred tax assets (International Monetary Fund; 2016).

In particular, governments generally impose strict limitations to the kind of impaired debts that are tax deductible to avoid banks and other financial institutions from using the discretion afforded to them by accounting standards for the purpose of tax avoidance. As such, depending on how strict these qualification requirements are, non-performing loans may constrain lending by financial institutions contributing to financial instability. Another possible source of instability is generated by the deferred tax credits that results from carried forward portfolio losses, such as those from non-performing loans (International Monetary Fund; 2016). Since the crisis these are not considered anymore as regulatory capital and, given that European financial entities still present them on their balance sheet from the sovereign-debt crisis, some European governments have elected to transform them in deferred tax credit allowing them to qualify again as capital. This has as its main effect that of transferring risk to the government, because they are claim on the government regardless of whether the bank is profitable or not in the future. This may possibly result in considerable fiscal costs and reinforce the bank-sovereign connection making countries even more susceptible to financial crises, and to the sovereign-bank doom-loops that they may entail (International Monetary Fund; 2016).

Conversely, in the real economy, higher-than-normal leverage as a result of the debt bias may contribute to worsening the adverse effects already detailed in the first paragraph of this sections. High leverage ratios have been found not only to increase the likelihood of a recession but also to make much more persistent when they eventually materialise (Sutherland and Hoeller; 2012).

The impact of the debt bias to the financial sectors are not limited to the ones listed above. In fact, excessive leverage in financial institutions may even be a greater concern for macroeconomic and financial system stability that in the non-financial sector (International Monetary Fund; 2016). Importantly, as highlighted by several scholars (such as Reinhart and Rogoff; 2009 and Allen et al.; 2009), increasing indebtedness in banks and other financial entities raises the likelihood of their default, an event that may easily spill-over to other institutions because of their considerable interconnectedness. Due to the system risk that widespread defaults in the financial sector would entail, public bail outs will ultimately exercise a negative impact on public finances potentially putting at risk the government own ability to service its obligations (International Monetary Fund; 2016). Similar concerns also apply to shadow banks, due to their considerable assets size. Shadow banks are "near-bank" financial institutions, such as hedge funds or insurance companies, that although not financed by deposits may sometimes perform a role that resembles that of traditional banks (International Monetary Fund; 2016). The magnitude of the negative externalities described above is related to the capitalisation of financial institutions. In particular, it has been observed that default risk rises more as a result of a marginal increase in the debt ratio if the bank is lowly capitalised - i.e., had already a lot of leverage to begin with (International Monetary Fund; 2016). This implies that, since banks were highly levered in the period leading up to the crisis, removing the asymmetric tax treatment of debt and equity would have reduced the likelihood of financial crisis by at most 40 percent (De Mooij et al; 2014). This is also confirmed by Langedijk et al. (2015) that, in their sample of European countries, finds that the elimination of the debt bias could have significantly lowered the direct costs of bail outs.

Since the great financial crisis, new regulations have been introduced with the purpose of reducing the debt ratios of banks and increase the amount regulatory capital held by them. This does not however eliminate financial stability concerns (International Monetary Fund; 2016). Firstly, the new Basel III capital requirements target mostly bank, continuing to leave shadow banks mostly unregulated. Further, the minimum amount of capital banks are required to hold is still way below that that would have absorbed the losses during the crisis

(International Monetary Fund; 2016). In fact, Dell'Ariccia et al. (2016) find that, to absorb the worst of the losses, the capital ratios should have been in between 15 and 23 percent. The continuing "higher-than-optimal" indebtedness of financial entities does not only stem from too low capital requirements but is in part also the consequence of the tension between the regulations and the tax system (International Monetary Fund; 2016). In particular, there clearly exist a conflict between capital requirements that encourage firms to hold more and better quality capital and the debt bias that, through its subsidy of interests, makes it more attractive for firms to hold capital in excess than what macroeconomic stability concerns would warrant (International Monetary Fund; 2016). Thus "the tax system still put financial firms at a higher risk of default that would a tax system neutral to sources of finance" (International Monetary Fund; 2016).

From an empirical perspective, few studies analyse the relevance of the debt bias for banks and other financial institutions. Of those that do, however, De Mooij and Keen (2016) find that, for their specific sample of financial institutions, taxation increases the amount of leverage they hold in their balance sheet. They also note that larger institutions are less sensitive to the distortions caused by most tax system. However, this does not mean that they are less of a risk to financial stability since, as noted above, the impacts exerted of the financial system is related to capitalisation. Larger financial institutions are generally more indebted implying that even small variations to the debt ratio may have quite considerable effects on default probabilities and financial distress (De Mooij and Keen; 2016). Similar findings are also confirmed by Hemmelgarn and Teichmann (2014) and Schepens (2016).

Further, as noted by the International Monetary Fund (2016), the debt bias also affects institutions other than banks in a way that is not too dissimilar. Two main examples are reported in that working paper. The first concerns investment banks that are found to be significantly impacted by taxation but only in the pre-crisis period. The other focuses on insurance companies. These undertakings are also affected by the debt bias, with debt ratios that are increased in the longer term by 2.8 to 4.8 percentage point as a result of a 10 percentage point rise in corporate income taxation (International Monetary Fund; 2016). However, as noticed also by Thinmann (2014), their macroeconomic implications are limited by the particular reserves they must hold to ensure the satisfaction of their obligations (International Monetary Fund; 2016).

These are not the only ways through which the debt bias may affect the macroeconomy. Thus, another relevant channel must be considered. The debt bias, in fact, hampers the

allocation of capital and consequently the growth of the stock market. Undercapitalisation of the stock market with respect to a neutral tax system in turn may negatively affect the growth in GDP per capita (European Commission; 2016). The misallocation of capital furthermore may impact in an adverse way firms' access to external financing and this is especially true for younger companies that are not yet well established in their market, impacting economic growth detrimentally (European Commission; 2016).

Lastly, the asymmetric treatment of different means of financing in the computation of the corporate income tax liability has another important implication, albeit with limited effects on stability, that arises in the international context. In fact, differences in corporate income taxation among countries may be exploited by multinational entities for the purpose of tax planning and debt shifting that may have considerable fiscal revenue implications (International Monetary Fund; 2016). This implies that, when choosing their capital structure, multinational firms face more complex challenges that those faced by entities operating in a single country as they have to choose the level of debt held by the group while also considering cross-country taxation. As such, the peculiar capital structure of a multinational will depend on the countries in which it operates. In this context, Hiuzinga et al. (2006) find that the debt-to-asset ratio in the entities constituting the multinational group is positively related not only with national taxation but also with differences in cross-country taxation. For example, a 10% tax rise in a country is found to increase the debt-to-asset ratio in that country by 2.44% while at the same time decreasing leverage in other countries by 0.6% (Hiuzinga et al. 2006). However, as noted by Miniaci et al. (2011) such a relationship is not always observed because of the effects that changes in corporate income tax rates produce. In particular, they argue, what is affected is not only how beneficial -from a tax minimizing standpoint- is moving debt across country (as evidence by Hiuzinga et al.; 2006 and several other papers) but, also how much is borrowed at both country and group level (Miniaci et al. 2011). In particular they show that an increase in the CIT rate in the country of the parent entity may increase the leverage of its subsidiary rather than decrease it as is often employed by the relevant literature. The mechanism for such an effect to materialise is the following: an increase in the corporate income tax rate in the country where the mother company is located, due to the increased benefit of the deductibility of interest expenses, reduces the incentives of shifting debt to the subsidiary while at the same time stimulating the parent to rise its own level of leverage (Miniaci et al. 2011). This is first part of the explanation appears to be in line with the literature and suggest that, as a result of the increase

in the CIT rate in the country of the mother company, the leverage in the subsidiary should fall as a result, but this is only part of the story. Miniaci et al. (2011), in fact, note that the increase in the leverage of the parent is then divided among the members of the group and, if this second dynamic dominates the first, the effect on the subsidiary indebtedness would be positive as a consequence. Indeed, they find that a rise in the corporate income tax rate of the parent increases also that of the subsidiary under two main conditions – the subsidiary is profitable and the mother company is in a high-tax country (Miniaci et al. 2011).

As might be understood, the mechanics of debt shifting between the parent and the other entities part of the group is far from being clear-cut. Depending on the characteristics of the members of the group and the specific dynamics governing tax planning strategies the effect on leverage may either be positive or negative as evidenced by Miniaci et al. (2011).

To summarise, as exemplifies by Picture 1 below, the asymmetric tax treatment of equity and debt and the resulting debt bias might exert several negative consequences that extend way beyond to changes in company's and shareholders' value of an individual entity. In particular, three main overarching repercussions might be identified. The first has to do with the dangers that excessive leverage and increased financial distress of financial and non-financial entities poses to the stability of the macroeconomy and the financial systems. These effects are particularly strong in those periods of time when the economy is already fragile – like a financial crisis, for example- and thus may exacerbate those negative externalities. This is the reason why, in the aftermath of the Great Financial Crisis and the Sovereign Debt Crisis, international institution like the IMF, the European Commission and even the Bank for International settlements, started to suggest that states address the bias and reintroduce a more neutral taxation system.

The second, on the other hand, also feeds back on economic growth in a negative way. In particular, the asymmetric treatment of debt and equity introduces inefficiencies in capital allocation reducing the capitalisation of stock markets and restricting the access to external financing to younger enterprises. Both consequences are detrimental to economic growth.

Lastly, what must also be considered is the fact that the debt bias encourages multinationals to use debt shifting and other tax avoidance strategy for the purpose of minimizing the burden of taxation of the group. This can have a quite significant impact of public finances in terms of lost revenues.

Figure 1: Main Drivers and Consequences of the Debt Bias[4]
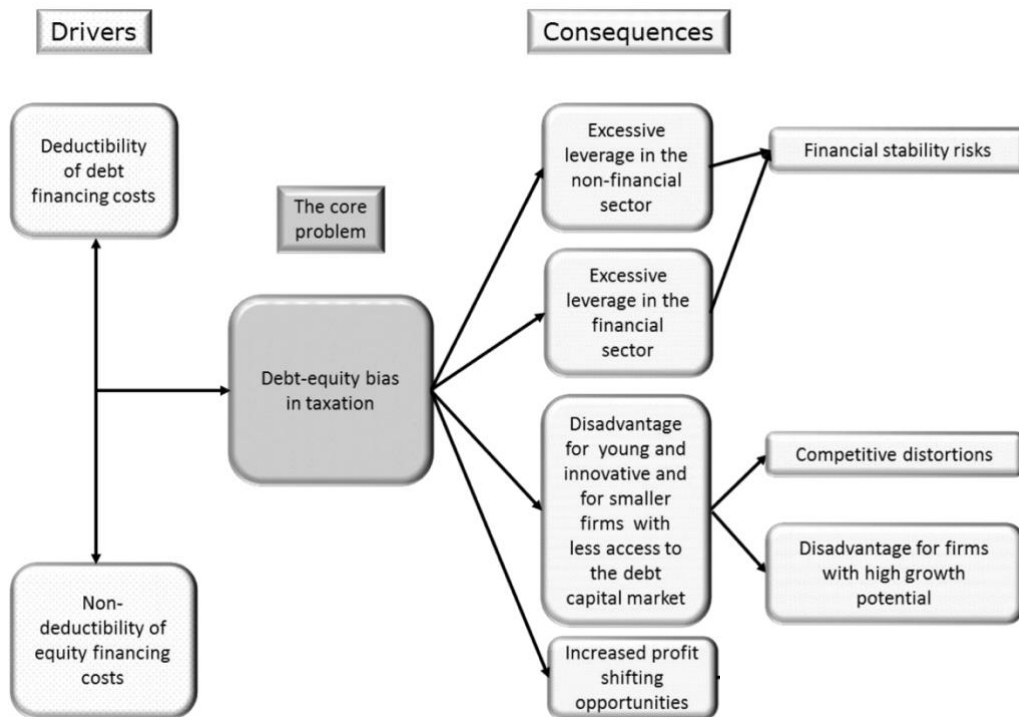
4 The source of the figure is the European Commission (2016).

16

3. Is there a reason for subsidising debt?

Considering the adverse impacts of excessive indebtedness highlighted in the previous section, one cannot help but wonder about why should debt be favoured to equity. The asymmetry in treatment appear to find its rationale not in economic sphere but in the legal one. In fact, interests have traditionally be considered a business cost while dividends are generally regarded as capital returns, and such a distinction is also reproduced in accounting principles – that only view interests and not dividends as a cost to the entity (de Mooij; 2011a). This explanation, however, has no meaning from an economic standpoint since as it completely ignores two important facts: i) both constitute a capital return, and ii) opportunity costs also exists and they should be considered (de Mooij; 2011a).

Generally, in fact the legal system distinguishes between equity and debt based on the characteristics that they possess or that they grant to those holding them. In particular, debt holders are entitled to receiving a return regardless of the financial soundness of the borrower and, if this were to become insolvent, they would have a preferential claim on the assets owned by the firm. Conversely, shareholders are residual claimants. Meaning that, in the event of a default of the entity issuing the shares, they receive the firm's assets last and only if there is some left. Additionally, dividends are not an obligation for the issuing entity and a failure to pay them would not default the firm (Frova and Hillier et al.; 2018). Another important difference is that, differently from bondholders, shareholders exercise control rights over the firm (de Mooij; 2011a). However, Devereux and Gerritsen (2010) argue, the distinction between the two sources of financing should be overcome. The increased complexity of financial instruments with the creation of new hybrids blurs more and more the distinction between the debt and equity and, consequently, introduces additional layer of complexity to the determination of whether something may actually be deducted from the imposable tax base. As such, reserving the two sources of financing a similar tax treatment would be much more reasonable (Devereux and Gerritsen; 2010).

Other considerable classification difficulties stem from intercompany indebtedness. Internal debt might be used by the group for reasons that have little to do with genuine financial needs, such as the exploitation of cross-country differences in CIT and other sources of legislative arbitrage for the purpose of minimizing the taxes. In this respect, for this type of debt the determination of the interest rate and of interest payments is very opaque, allowing further opportunities for profit shifting (de Mooij; 2012).

From an economic standpoint, one could find in imperfect markets the reason for such a discrimination. While it is true that the choice of the capital structure of a firm does not matter in world of perfect markets and information (Miller and Modigliani; 1958), when real-world markets are considered, inefficiencies could lead firms to choose level of debt that is socially undesirable (de Mooij; 2011a). In this framework, allowing interest expenses to be deductible could be envisaged as a solution to these capital structure distortion (de Mooij; 2011a). However, as noted by de Mooij (2011a) and aus dem Moore (2014), not only none of the theories described in Section 1 of this Chapter is able to provide a compelling explanation of why tax systems should favour debt but, more importantly, they also often imply different reasons for the capital structure distortions.

Another possible reason for the asymmetric tax treatment of equity and debt may rest on the fact that the two are treated in an asymmetric way also at the individual level with personal income taxes on dividends and capital gains being usually lower than those of interest received (Gordon; 2001). Empirical studies (such as those of Graham; 2003 and the European Commission; 2016) appear to disprove this hypothesis since, even after accounting for differenced in personal taxation, debt continues to be favourite to equity.

In light of this analysis then it can be concluded then that there is no economic or legal reason why the tax system should discriminate between equity and debt and provide a more favourable treatment to the latter. Further, considering the negative impacts excessive leverage might exert on the financial system and the macroeconomy, the introduction of a more neutral tax system might be beneficial (aus dem Moore; 2014 and Fatica et al.; 2012).

II.   How to Address the Debt Bias? A Case Study of the Italian Allowance for Corporate Equity

1.   How to Address the Debt Bias? A Review of the Main Solutions Available

Several solutions have been proposed to address the debt bias and introduce more neutral corporate income tax systems. Among several options available the five that are most often cited in the literature are the following: i) thin capitalisation rules (TCR) and other limits to interest deductibility, ii) the comprehensive business income tax (CBIT), iii) the allowance for corporate equity (ACE), iv) the allowance for corporate capital (ACC) and, v) the cost of capital allowance (COCA). This section, while presenting a brief review of all these measures, places most of its attention on thin capitalisation rules and the allowance for corporate equity. The reason behind this choice is related to the relevance this two policies have for the investigation carried out in the dissertation. Concerning the first, limitations to interest deductibility are essential to understanding the impact that differences is cross-country corporate income taxes exert on the leverage of Italian subsidiaries (this is explained in more details within Chapter 3). Conversely, ACE is in fact the only one of the allowances cited that is actually employed in practice by countries (even if only by a few of those of interest for the analysis presented in Chapter 3). Furthermore, due to the implementation of ACE in Italy since 2011, the access to the allowance is a characteristic shared by all Italian subsidiaries (and mother) constituting the sample (also described in Chapter 3).

1. *Thin Capitalisation Rules and other Limits to Interest Deductibility*

Thin capitalisation rules approximate the treatment of debt to that of equity by treating the first more similarly to the second (International Monetary Fund; 2016). This is carried out through the imposition of a limitation to the deduction of interest expenses, that could be roughly compared to imposing a tax on interest, thus reducing the favourable treatment of debt over equity. As such, limiting interest deductibility may be considered one of the least radical ways of reintroducing some neutrality to the tax system (International Monetary Fund; 2016). Further, they also serve as a device to correct and reduce the negative externalities that arise from excessive levels of indebtedness by directly tackling the incentive – the possibility of deducing interest expenses – to take additional debt above a certain

threshold. This is also the reason why the most widely employed of the thin capitalisation rules uses the debt-to-equity ratio to limit interest deductions (International Monetary Fund; 2016). Thin capitalisation rules are applied by most countries in the world but their design may differ quite substantially from a jurisdiction to the other. As noted by the International Monetary Fund (2016), two main characteristics differentiate thin capitalisation rules. The first concerns the applicability of the limitation to interest deduction to all debt or only to debt from related parties (such as intragroup lending). The other characterising feature is the kind of rule or threshold that limits the interest deduction (International Monetary Fund; 2016). Within this second group, three main alternative designs for thin capitalisation rules have been recognised. **Fixed debt-equity rules** are the most widely employed by countries around the world and they entail a non-deductibility of interest expenses beyond a certain debt-equity ratio threshold (International Monetary Fund; 2016). Coming second in order of employment worldwide are **earnings stripping rules**. Generally, when these are in place, interest may be deduced only as long as it does not exceed 30% of EBITDA (or another measure of the company's ability to service its obligations). Earnings stripping rules not only are more sophisticated that their debt-equity ratio counterpart but there are also useful in limiting tax avoidance strategies that may involve interest expenses (International Monetary Fund; 2016). Lastly, **arm's length rules** may also be employed. Differently from the other two alternative designs, arm's length rules are only addressed to related party indebtedness and, as such, disallow deduction in a subsidiary if this has a leverage that is not similar to that of the global owner. Alternatively, interest deductibility may be impeded in a subsidiary when its net borrowing cost is higher than that of the group (International Monetary Fund; 2016). These features may either be used in isolation or in combination with the other – and indeed this is the case in few countries, such as France and the United States. In general, the G20 and OECD, suggest the implementation of thin capitalisation rules having the earnings stripping feature. The reasons for this are related to the fact that, especially in the presence of group ratio rule, they are better suited than the other alternative measures in addressing debt shifting and tax planning among members of the same group (International Monetary Fund; 2016). However, the main drawback of earnings stripping rules is that, differently from those based on the debt-to-equity ratio, they are not designed specifically to address the debt bias and are more sensitive to cyclical fluctuations (International Monetary Fund; 2016).

2. The Comprehensive Business Income Tax (CBIT)

First envisaged in 1992 by the US Treasury Department, the comprehensive business income tax addresses the asymmetric treatment of equity and debt by disallowing the deduction of interest expenses from the computation of the corporate income tax base. This also means that corporate profits are taxed after deducting depreciation but not interests (Spengel et al.; 2016, and Mirrlees et al.; 2011). Corporate income taxation can then be seen as a base-broadening source tax applied at company level and where all capital is taxed at the firm-level (De Mooij and Devereux; 2011). For this reason, CBIT should be coupled with a removal of all taxes levied on the capital income of shareholders (US Treasury Department; 1992). CBIT should supposedly be helpful in addressing issues related to tax avoidance and profit-shifting by multinational companies, by preventing them from allowing their subsidiaries located in high-tax countries to borrow from those in other jurisdiction and deduct interest payments[5] (Mirrlees et al; 2011 and Fatica et al.; 2012).

The comprehensive business income tax, however, is not free from problems. Even if it appears neutral at a first glance, depending on the rate of inflation and on the existing allowances for depreciation, equity and debt financed investments would still have different rate of returns (Mirrlees et al; 2011). Further, several issues concern the tax treatment of banks and financial institutions. This is because, in order to achieve symmetry under a CBIT system, interest received would not be taxed. This would imply that the bank profit originating from the spread between interests income and interest payments would be virtually tax exempt, shifting the tax burden completely on the borrowers (Mirrlees et al; 2011 and De Mooij; 2011a).

3. The Allowance for Corporate Equity (ACE)

The allowance for corporate equity was suggested by the IFS Capital Taxes Group in 1991. This measure is aimed at establishing equal treatment of equity and debt by allowing the deduction from the computation of the imposable tax base of a specific return (the notional interest rate) for equity. The notional interest rate is generally set close to that of certain risk-

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[5] Understandably, CBIT would only achieve this objective if all countries apply a similar system. Otherwise a country would just end up driving multinational away from their territory (European Commission; 2016).

free assets, such as government bonds (Spengel et al; 2016). This has as its main consequence the elimination of the normal return on investments financed by equity from the tax base so that only "abnormal" returns are taxed (Mirrlees et al.; 2010).

An allowance for corporate equity may be designed in several ways depending of the features that characterise it. Firstly, ACE may either apply to all equity or only to incremental equity - the difference between current equity and the stock of equity in the reference year (European Commission; 2016). This first is adopted by Belgium and is usually named *hard* or *stock-based* ACE. The second, on the other hand is currently employed in Italy and takes the name of *soft, partial* or *incremental* ACE. Another defining feature is related to the how the nominal interest rate is set. In fact, this may be set in two main ways. It may be defined, with respect to the reference interest rate, by policymakers at the beginning of a fiscal year or it may be indexed to the reference rate so that the two vary together (European Commission; 2016). Lastly, the other relevant characteristics concerns the presence or absence of anti-abuse rules in the design of the allowance (European Commission; 2016).

With respect of this last point it is important to notice that the allowance for corporate equity on its own, without any measures to avoid abuse to accompany it, does not address debt shifting and tax avoidance concerns and may even end up worsening them. In fact, if ACE is implemented unilaterally then it increases multinationals' scope for minimizing corporate income taxes (Hebous and Ruf; 2017). An example of typical debt-shifting (or double-dipping) set up may be described as follows. Let's assume that a multinational group has three main subsidiaries. Two – Entity A and C - are located in non-ACE country while the third, Entity C, is in an ACE-country. Entity A obtains a loan from the mother and then lends it as share capital to Entity B. Entity C then receives the same amount as a loan from Entity B and pays interests on it. This scheme allows Entity A and C to deduct the interest expenses from the imposable tax base, while Entity B may take advantage of the ACE deduction on the amount it receives from A. Further advantages for the multinational group may be reaped by taking advantage of ACE further through the cascading of ACE deductions. This means that Entity C could send the loan back as equity capital to Entity A allowing it to double the allowance it receives on equity (Hebous and Ruf; 2017). It is easy to see then why the implementation of an allowance for corporate equity is often complemented by anti-avoidance rules.

Another issues with ACE is that the notional interest rate is seldomly set at the level actually needed to achieve a symmetric treatment of equity and debt and, as a result, neutrality is not achieved in full (European Commission; 2016).

Lastly, the problem that is most concerning for governments is that ACE restricts the tax base entailing a reduction in fiscal revenues. The impact might be mitigated by increasing the corporate income tax rate, but this would hardly be feasible due to public resistance and the threat of rising profit shifting to low-CIT rate jurisdictions (Cottarelli; 2009).

Despite its possible drawbacks, the allowance for corporate equity is the only one within the possible measures to solve the debt bias that has been most widely employed by countries around the world (with the exception of thin capitalisation rules). Although, it has often been terminated after just a few years, ACE appears to have been successful in achieving its objective and reducing debt-equity ratios in most of the countries that adopted it (Bordignon et al; 2001 represents a notable example). Further, even if a lot of studies have not been conducted on the topic, there is a scope ACE to increase the amount of Tier 1 capital held by financial institutions, since the allowance makes holding capital less costly (Cottarelli; 2009).

4. The Allowance for Corporate Capital (ACC)

The allowance for corporate capital, first investigated by Boadway and Bruce in 1984, allows firms to deduct a certain risk-free return on capital regardless of its form (equity or debt). In a way the ACC may be seen as the combination of two other measures – the allowance for corporate equity and the comprehensive business income tax- as it introduces neutrality by allowing some return on equity deduction while at the same time limiting the deductibility of interests (Fatica et al.; 2012 and European Commission; 2016). Although never having been applied in practice, the contemporaneous introduction of a partial ACE and CBIT would presents several advantages to applying the two reforms on their own. Firstly, it could be designed in such a way that would not result in any revenue loss for the government while still maintaining neutrality in the tax treatment of equity and debt (Fatica et al.; 2012). In this respect, De Mooij and Devereux (2011) show that, regardless of whether ACC is implemented unilaterally or simultaneously in all European Member States, tax neutrality is effectively achieved and welfare is improved.

5. The Cost of Capital Allowance (COCA)

Similarly, to the allowance for corporate capital, the cost of capital allowance is also a combination of a partial ACE and a partial CBIT that applies a uniform deduction to all

capital (Spengel et al.; 2016 and European Commission; 2016). The difference between the measure proposed by Kleinbard in 2007 and that Boadway and Bruce (1984) however rests on the treatment of shareholders. Under COCA, in fact, capital gains are not taxed anymore and shareholders are subject to taxation only for the return on investments that equal the amount deducted at firm level. Any return exceeding such an amount is virtually tax exempt (Spengel et al.; 2016). The cost of capital allowance is generally considered a too far-reaching measure since in requires not only a modification of the tax system at corporate level but, also at the individual one (European Commission; 2016).

6. *Other alternative measure*

Two other alternative and less famous measures to the achievement of a neutral tax system are the allowance for growth and investment and cash flow taxes. Concerning the first, it is just a modified incremental ACE where deductions are granted only for the cumulative increases in equity over a period defined with respect to a reference past date (European Commission; 2016).

The second, on the other hand, is more radical measure first proposed by the Meade Report that envisages a substitution of taxes on company profits with taxes on net cash flows. The R-base, a particular iteration of cash flow taxes, replaces deductions of interests and depreciation with one on incurred investment expenses. This would eliminate the asymmetric treatment of equity and debt (Mirrlees; 2011).

2. ACE in Practice: the Italian Case

1. *A Brief Review of the European History with the ACE*

Over the years several European countries implemented an allowance for corporate equity. The first to endeavour its implementation were Croatia (1994), Italy (1997) and Austria (2000). These countries respectively abandoned the experiment in 2000, 2003 and 2004 (aus dem Moore; 2014 and Hebous and Ruf; 2017). This was however not due to a failure to achieve the prescribed objectives – such as that of reducing enterprises debt to equity ratios- but mostly due to changes in government that reformed the system with the objective of broadening the tax base while at the same time lowering CIT rates (Keen and King; 2005). This trend was reversed in the aftermath of the global financial crisis with the recognition by economic experts that the debt bias has contributed to the build-up of indebtedness in the period leading up to the crisis (European Commission; 2008 and Cottarelli; 2009). Among the many measures to eliminate the asymmetric treatment of debt and equity , the allowance for corporate equity has generally been favoured by experts including the IMF (Cottarelli; 2009), the European Commission (2008); and the Mirrlees Review (Mirrlees et al.; 2011) among others. This encouraged several European countries to re-introduce or introduce for the first time an allowance for corporate equity. Of those introducing ACE in the aftermath of the crisis, only two continue to implement a soft version of it. These are Italy (2012) and Cyprus (2016). An exception to this rule is Belgium. The country has been applying a hard version of the ACE since 2006, before the crisis even occurred, and has done so without interruption (Hebous and Ruf; 2017). Table 1 below provides a summary of the employment of the allowance for corporate equity in the European Union, covering the period since its first implementation.

Due to the relevance of debt financing for Italian corporations that have historically been much more reliant on debt than their European counterparts[6] (E. Zangari; 2014), a rigorous review of the measures that have been undertaken over the years to address the debt bias is surely warranted. Further, such an overview is also justified by the need to provide some information about a few of the features of the Italian tax system that the affiliates in the sample employed are subject to.

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[6] In 2007, for example, the average debt to asset ratio of Italian companies exceeded of 9 percentage points the European average (E. Zangari; 2014).

Table 1: Implementation of the Allowance for Corporate Equity in Europe

The ACE in Europe

Country		Type of ACE
Austria	2000-2004	Incremental
Belgium	2006 – still in place	Hard
Croatia	1994-2000	Hard
Italy	1997-2003 2012 – still in place	Incremental
Latvia	2009-2014	Incremental
Liechtenstein	2011-still in place	Hard
Portugal	2010-2013	Incremental
Cyprus	2016-still in place	Incremental

Notes: the source of this table is Hebous and Ruf (2017).

1. ACE and the Tax Reforms of the 1990s

As noted above, Italian companies have been traditionally more exposed to debt than entities in other European countries (European Commission; 2016). Several factors contribute to this phenomenon such as informational asymmetries, market inefficiencies and the relevance of small and medium enterprises in the Italian economy (E. Zangari; 2014). The situation has also been worsened by the preferential tax treatment that the country affords to debt. Italy has in fact always incentivised debt-financing quite strongly with the amount of tax saving as a percentage of interest paid exceeding 40% per the great part of the period 1982-2000 (E. Zangari et al; 2014).

To address this longstanding issue several fiscal reforms have been introduced in the 1990s. However, we must first take a step back. Before the application of these measures, since its introduction in the 1970s, corporation in Italy were subject to one main corporate income tax the "Imposta sul Reddito delle Persone Giuridiche" (IRPEG). IRPEG is characterised by a flat rate that has been around 36% or 37% over the period 1983-2002 and uses book income as the base for its computation. Within this system, interests are fully deductible as long as they may be considered a cost of doing business (Bernasconi et al; 2005). In addition to IRPEG, two other corporate taxes were also levied in the 90s. The first, is the "Imposta Locale sul Reditto" (ILOR) that was characterised by a uniform CIT rate of 16.2% that ceased to be deductibles in full or in part in 1993. ILOR was subsequently abolished in 1997.

The second, in place from 1992 to 1997, was a tax on corporations' net worth with a rate 0.75% levied with the objective of collecting more tax revenues (Bernasconi et al; 2005).

The first reform with the potential to target indirectly the non-debt tax shield (since its main purpose was actually that of stimulating the economy) was the "Legge Tremonti" in effect from 1995. This was a temporary measure granting firm an investment tax credit on 50% of the investment carried out in 1995 as the amount exceeded average investment in the previous five years. Such a tax credit could not be carried forward indefinitely, but only up to five years (Bernasconi et al; 2005). As noticed by Monacelli et al. (1999), due to its temporary nature, the reform resulted in a 20% spike in investments for the year 1995. This also meant that, since to be eligible for the tax credit companies had to invest more than the average over the previous five years, 60% of corporation actually invested more than that amount (Monicelli et al.; 1999).

The second measure was the introduction of a soft or incremental allowance for corporate equity – the Dual Income Tax (DiT)- as part of a package of reforms to make the tax system more neutral that became effective in 1998. The package first removed ILOR and the net worth tax to put the "Imposta Regionale sul Attività Produttive" (IRAP) in its place. IRAP introduced some neutrality to the system by means of its inclusion of interest payments in the computation of the imposable tax base (Bernasconi et al; 2005). The asymmetry in the tax treatment of equity and debt is further reduced by the introduction of the dual income tax. DIT divides the profit of a corporation into two components – ordinary and abnormal – that are taxed at two different rates. Ordinary income was taxed at a lower rate of 19% since it represents the opportunity cost of using equity rather than debt and it is this feature that allow the measure to be considered a soft ACE. The abnormal component, also called extra-profits, was on the other hand taxed at the usual IRPEG rate (Bernasconi et al; 2005, Panteghini et al.; 2012, and Zangari; 2014). The approach to DIT may also be considered "soft" not only because of the reduced rate applied to ordinary equity, but also because of the way it was implemented and structured. In particular, the lower tax rate to ordinary equity only applied to incremental equity – new capital and retained earnings- rather than to the whole stock (Panteghini et al.; 2012). Additionally, the reform was implemented gradually. Incremental equity was to be assessed against the stock of equity at the beginning of 1996 with no DIT benefit for that year. The rate applicable to ordinary income was then slowly increase over time. Such an approach was dictated by the need to keep the public accounts

closely monitored in order to enter in the European Monetary Union (Panteghini et al.; 2012). The Dual Income Tax was ultimately abandoned in 2003 but, since the election of a centre-right government in 2001, the stance towards the measure had already started to change and dwindle (Panteghini et al.; 2012). Regardless of the short lived nature of the reform, this has not failed to achieve its objectives. In fact, Bernasconi et al. (2005) find a reduction in leverage in the examined samples of entities

The last important measure of the 1990s that is relevant for addressing the debt bias is the introduction of the "Visco" investment tax credit limited to equity financed investment. This means that, provided that the average corporate income tax rate did not fall below 27% (a requirement in place also for DIT, a 19% tax rate applied to profits equalling the amount of investment financed by new equity. Similarly, to the "Legge Tremonti", the "Visco" investment tax credit was also supposed to be temporary and was mainly implemented to help corporation in the transition towards a system that would have eventually taxed all equity as ordinary income. Needless to say, that with the subsequent change in government this never took place (Bernasconi et al; 2005). Regardless of these considerations, the "Visco" investment tax credit was found by Bernasconi et al. (2005) not to produce results that are significantly different from those produced by the "Legge Tremonti". This means that in terms of reducing the debt bias, it does not really matter whether the measure is restricted to equity financed investments or not (Bernasconi et al; 2005).

To summarise, the reforms enacted in the 1990s for the purpose of stimulating growth and reducing the reliance on indebtedness as the main source of financing for Italian corporations were effective in achieving their objectives. For all reforms a significant substitution effect was observed. This was as its strongest for the dual income taxation, even though it was a structural measure rather than a temporary one (a feature that might potentially have enhanced substitution of debt with equity), and considering that it is a partial or soft ACE and not one applied on the total stock of equity (Bernasconi et al.; 2005).

2. More Recent Modifications to the Tax System and the Reintroduction of the ACE

The Italian tax system underwent another major reform in 2008. The new measures had as their main objective the reduction in statutory rates, with IRPEG decreasing from 33% to 27.5% and IRAP from 4.25% to 3.9%. To counteract the ensuing reduction in fiscal revenues several initiatives have been undertaken. Among these a limitation to the deductibility of interest rates is introduced as a replacement to thin capitalisation rules previously instituted in 2004 (Zangari; 2014). Due to its design, however, the scope for this measure to reduce the debt bias is questionable. In fact, the limitation to interest deductibility is structured in such a way that does not prevent interest payments to be deducted when above a defined threshold, but simply postpone their deductibility when they exceed a certain amount (Zangari; 2014).

A further modification of the Italian tax system took place in 2011 with the adoption of the "Aiuto alla Crescita Economica". The main characteristic of this reform is surely the reintroduction of the allowance for corporate equity (Zangari; 2020). This new iteration of the ACE is in way not so different from the dual income taxation that preceded it. In fact, profit is still divided into two different parts – ordinary income and "extra-profits" (Panteghini et al.; 2012). Now, however, incremental ordinary income (with respect to the stock of equity of the corporation in 2011) is deductible from the imposable tax base at a notional rate of return (Zangari; 2020). The imputation rate (the applicable notional interest rate) is set one year in advance by the Minister of Economics and Finance and it may be at most 3 percentage points (depending on risk consideration) above the average rate of return on public bonds (Panteghini et al.; 2012 and Zangari; 2014). As might be observed in Table 2, the allowance for corporate equity is strengthened over the first 6 years from its introduction (from 2011 to 2016). The trend is then reversed, and the notional rate is decoupled from the average return on public bonds and progressively reduced over time until ACE is ultimately abolished in 2019.

Table 2: Notional ACE Rate over 2013-2020

ACE Notional Interest Rate

Year	Rate
2011	3.00%
2012	3.00%
2013	3.00%
2014	4.00%
2015	4.00%
2016	4.75%
2017	2.30%
2018	1.50%
2019	0.00%
2020	1.30%

Notes: this table shows the ACE notional interest rate applicable in Italy in the period $2011 - 2020$. The data has been obtained from the Taxes in Europe Database of the European Commission.

In 2019 ACE is substituted by the "Mini-IRES" that applies lower taxes to any income exceeding the undistributed profits in the previous year. Experimentation with the Mini-IRES was very short-lived. The measure, due to excessive complexity, was modified already a few months after its implementation and was ultimately abolished for the year 2020 (Nastri et al; 2019 and Zangari; 2020). ACE was reintroduced in 2020 and is currently still in place. Moving beyond this general overview of the allowance for corporate equity in Italy, more attention must be devoted to some of its more relevant features: the definition of the ACE, its incremental nature, and the existence of anti-avoidance rules.

The **ACE base** was first defined by a Decree of the Ministry of Economics and Finance in 2011, but it has been modified several times since then and this is especially true for the period 2017-2020 that has seen a weakening of the allowance (Zangari; 2020). As it was first conceived, an equity increase is determined by the summation and subtraction of certain specific elements. In particular, increases in the stock of equity are determined by two main factors – cash contributions (such as increases in capital and loan forgiveness) and net profit allocations to reserves, excluding those that are unavailable or non-distributable (Council of the European Union; 2018). Conversely, the factors that do not constitute equity increases are three. These include, increases in the value of all securities but shares (this does not apply to financial institutions or insurance undertakings), increments in reserves that are determined by changes to the fair value of derivatives, and certain kinds of unrealised gains

in capital (Council of the European Union; 2018). Elements that reduce the stock of equity are distribution to shareholders or partners that are voluntary in nature, like those of retained earnings or assets, and buybacks of stocks (Council of the European Union; 2018 and Panteghini; 2012). Importantly, incremental equity may also be reduce by anti-avoidance provisions (that are described in more details below). In general, a feature that characterises all anti-abuse measures (excluding those concerning loans) is that they constitute a reduction to equity that is permanent in time. This means that, even when the condition for the application of the anti-avoidance rule does not exist anymore, the ACE base will continue to be reduced (Zangari; 2014). Lastly, the base for the computation of the ACE corresponds to the equity initially contributed for recently established business entities (Council of the European Union; 2018).

As already mentioned, the ACE regime implemented in Italy is **incremental**. This implies that in theory it should be more efficient than an ACE implemented on the full stock of equity, such as that employed in Belgium. The reason for this is that, under a hard ACE system, corporations are allowed to apply the ACE deduction on the capital they already had. This means that one may benefit from the ACE even if equity financing is not increased (Zangari; 2014). Another important difference lies in the impact the allowance for corporate equity exerts on public finances over the short and medium run[7]. Considering an open economy, the introduction of the allowance for corporate equity in a country will stimulate both domestic and foreign investments over time. This in turn will increase the returns of that country's productive factors that would ultimately allow to recover part of the fiscal revenue lost due to the introduction of the ACE. This means that, while it is true that tax revenues fall after the implementation of the allowance for corporate equity, the positive effects this will have on the economy (such as increased GDP) should ultimately offset the loss in the longer term (Zangari; 2014). Within this framework, a soft or partial ACE, should be better suited to match the cost of the reform with its benefit by reducing the short-term loss in revenues by becoming more cumbersome as its benefits materialise (Zangari; 2014). However, the positive impacts of the incremental ACE might be limited by the reclassification of "old" equity into new one in order to make the most out the deduction. However, the methods to do so are mostly tackled either by ACE-specific anti-abuse provision or by those that are more general in scope (Zangari; 2014).

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[7] The divergence between of the two systems is transitional. This stems from the fact that, in the long run, the ACE will be applicable to all equity even under the incremental system (Zangari; 2014).

The presence of **anti-abuse provisions** is "one of the most important parts of the Italian ACE legislation, dealing with the revenue losses that may stem from an ACE reform due to tax planning reasons" (Zangari; 2014). Anti-avoidance provisions are aimed at tackling two main issues: i) the cascading of ACE benefits (a phenomenon briefly describe in Section 2 of Chapter 1), and ii) certain assets sales that may change the categorization of older equity into incremental equity. To do so, several measures are implemented. For instance, certain contributions made to participations (such as cash contribution and loans, among others) reduce the base employed for the computation of the ACE for the business entity[8] that makes such a contribution (Zangari; 2014). Further, to tackle the tax planning opportunities on non-resident companies, contributions in cash made by entities located in a country were mutual exchange of tax information does not apply must always be deducted from the relevant base for the computation of the ACE. Alternatively, if the company is located in a country that has agreed to the exchange of information for tax purposes, such deductions are envisaged only if the foreign entity is controlled by an Italian one (Zangari; 2014).

Concerning the cascading of ACE benefits, much stricter conditions are applied to non-resident companies that reside in a "black listed" country. On the other hand, for those not blacklisted, the Italian legislation tries to avoid the penalisation of equity that is forwarded to resident corporations and, as such, only focuses on the most dangerous infractions. Generally, however, even for the second category tax authorities carefully examine new equity injection and loans between entities of the same group (Zangari; 2014).

While having much more stringent conditions than those in place in Belgium, the incremental nature of the Italian ACE still leaves room for manipulations that fall beyond the scope of the ACE anti-abuse rules. However, this does not mean that such opportunities cannot be captured by the legislation since general anti-avoidance rules may also apply (Zangari; 2014). As provided by Zangari (2014), some examples of tax schemes that are captured by the Italian anti-abuse framework are the following:

1. Since contribution in kind are not included in the computation of the tax base, the benefit of the allowance cannot be boosted by the creation of a subsidiary.

2. The cascading of ACE benefits through an Italian holding company having no ACE base is prevented by anti-abuse rules on intra-group loans. While,

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[8] For the purpose of the legislation it must be stated that the definition of business entity is inclusive of resident corporation, partnership as well as entrepreneurs (Zangari; 2014).

the scope for cascading of ACE benefits, such as those described in Section 1 of this Chapter, is eliminated for foreign entities that reside in black-listed countries and it is greatly limited (and closely monitored) for those in white-listed countries.

In general, however, some kind of double-dipping scheme trying to magnify the benefits coming from the ACE and the deductibility of interest expenses are still feasible, but they are much more complex (Zangari; 2014).

3. *Thin Capitalisation Rules or Interest Deductions*

Limits to the deductibility of interest expenses also contribute to a small degree to reducing the debt bias. As noted in the first section of this Chapter, Italy does not have thin capitalisation rules anymore and this has been the case since 2004 (Zangari; 2014). However, this does not imply that no limitations to the deductibility of interests are in place. In fact, while it is true that interest expenses are usually deductible in full, when the deduction exceeds a certain threshold represented by interest income the expense is deductible only up to 30% of gross operating margin (PwC Worldwide Tax Summary; 2013). Gross operating margin is the difference between operating revenues and expensive exclusive of depreciation and other similar charges. For this reason, this often approximated by Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA). Up to 2019, the excess net interest expense could be carried forward indefinitely and it can be employed in any fiscal year where there is no excess (Ernst and Young; 2020). Further, the limit to deductibility may apply also to consolidated tax groups. This implies that, those companies of the group that have an excess deduction of interests may "lend" it to those entity belonging to the same tax group that find themselves in a deficit, thus contributing to lowering their tax burden (PwC Worldwide Tax Summary; 2013). The Legislative Decree N. 142/2018 (effective from 2019) changed slightly this framework. Firstly, the computation of the 30% of EBITDA threshold now relies on tax rather than accounting figures. The definition of interest expenses is also modified to include also those expenses capitalised in the purchase cost of goods (Ernst and Young; 2020). The most important change among the one introduced is that related to the introduction of a limit to the number of years the excess interest income could be carried forward. This is especially relevant because, as mentioned at the end of Section 2 of this Chapter, the possibility to carry the excess of 30% of EBITDA indefinitely was one of the main reasons why one could not expect the measure to have any impact on the debt bias (Zangari; 2014). Thus, limiting the possibility to carry forward the excess interest deduction

to only five years might possibly improve the situation. However, given that the same Decree allows the excess deduction to offset interest expense in any year - not only in those where the EBITDA threshold was not exceeded as happened under the previous rules – the effect these two measures on the debt bias is far from clear (Ernst and Young; 2020).

The main design features of the Italian allowance for corporate equity might be summarised by three main elements[9]: i) it is incremental; ii) the ACE rate is fixed a year in advance with reference to the interest rate on government bonds[10]; and iii) it is complemented by anti-abuse provisions (Table 3, provides a summary of these and some other relevant features). Overall, empirical studies investigating the impact of this new iteration of the Italian allowance for corporate equity find that it achieves its objective of lowering the debt ratios of the eligible corporations. Zangari (2014) finds in his study comparing the Italian and Belgian ACE, that the Italian measure was successful in reducing the differential tax treatment between equity and debt (already bringing it below the European average by 2012) by lowering the equity cost of capital. Further, a study published by the same author in 2020, confirms that over the period 2011-2015 the ACE was effective in bringing the tax system closer to neutrality and in incentivising equity financed investment. The decrease in the notional rate in the subsequent period however widened the debt bias again. The author also compares ACE with the Mini-IRES and confirms the positive properties of the first over the second (Zangari; 2020). Panteghini et al. (2012), focusing on the first year of the ACE implementation, also finds that it reduces leverage in a significant way.

It may thus be concluded that both Italian experiences with the allowance for corporate equity have been generally found by the relevant literature to effectively address the asymmetric tax treatment of equity and debt by reducing the debt bias. This is confirmed by the observation that, in the period in between the two reforms, the effective marginal tax rate of equity finance increases sharply as a consequence of the abandonment of the duel income tax system (Panteghini et al.; 2012).

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[9] The three characteristics are those defined by the European Commission (2008). They are the following: i) whether the ACE is soft or hard; ii) how the ACE rate is defined; and iii) whether it includes anti-abuse rules or not.

[10] Or at least it is set in such a way for the period of time going from its reintroduction to 2016. From the moment onward the ACE is weakened and the rate its decoupled from the that on public bonds (Zangari; 2020).

Table 3: Main Features of Italian ACE

Features of the Italian ACE

Type	Incremental
ACE base	Equity and cash contribution Retained earnings Shareholders' credit waver (among other relevant determinants)
ACE rate	Average rate of public bonds + 3% (at most) to account for risk. Only for the period 2011-2016.
Scope of Application	The business sector including all business entities (corporations, partnerships and individual entrepreneurs).
Carry forward	Indefinitely (2011-2018) 5 years (since 2019)
Anti-avoidance provision	Yes

Notes: most information summarise those presented above and as such have the same sources. The only exception to the rule is the ACE base that has been taken the website of the Italian Tax Authority (https://www.agenziaentrate.gov.it/portale/web/english/nse/invest-in-italy/allowance-for-corporate-equity-ace-)

III. Data and Model Definition

1. The Research Question

As detailed in the first chapter of this thesis, the study of leverage and of its determinants is of extreme relevance. This appeared strikingly clear in the aftermath of the Great Financial Crisis when academics and experts recognised in the excessive leverage held by both financial and non-financial entities one of the factors that magnified the adverse impacts exerted by the event on financial markets and the real economy (International Monetary Fund; 2009 and European Commission; 2016). The reason for those excessive levels of leverage are surely multifarious but, one of the culprits behind it is surely to be identified in the debt bias resulting from the asymmetric treatment that most tax systems grant to debt and equity (Cottarelli; 2009).

Furthermore, this tax asymmetry is also accused of indirectly reducing the fiscal revenues of governments by incrementing the tax planning and debt shifting opportunities of multinational companies that, by taking advantage of differences in cross-country corporate income tax rates and of other features of the tax systems, are able to minimize the tax burden of the group (International Monetary Fund; 2016).

Within this context, the empirical investigation has as its main objective that of investigating how differences in cross-country corporate income taxes and in the limitations to the deductibility of interest expenses affect the indebtedness of Italian subsidiaries.

The rationale behind this decision is to be found in two main factors. The first is observation by Miniaci et al. (2011) that the relationship between the parent company's capital structure decisions and that of its subsidiaries as a result of changes in taxation are much more complex than what is generally assumed. In fact, in the relevant literature the debt shifting behaviour of multinationals is usually assumed to be determined by two main factors: the tax rate of the host[11] country and the differential tax rate between the parent company and the "daughter" (Miniaci et al.; 2011 and Buettner and Wamser; 2007). In this framework, the host country CIT rate, due to the increased benefit from the deductibility of interest expenses, is expected to increase subsidiary leverage (Miniaci et al. 2011). Conversely, an

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[11] In this work, the country where the subsidiary is located is the host country. Conversely, the home country is the country housing the parent of the group.

increase in the home country corporate income tax rate (all else being equal) will disincentivise indebtedness in the subsidiary due to the fact that the tax shield of debt is now more valuable to the parent (Miniaci et al.; 2011 and Hebous and Ruf; 2017). However, Miniaci et al. (2011) argue, these are not the only things that matter. The home country CIT rate should be considered relevant not only as a component of the tax differential between parent and daughter but, also, when it is own. This means that, increases in the home tax rate might eventually increase not only the indebtedness of the parent company, but also that of the subsidiary through the sharing of internal debt between the two entities (Miniaci et al.; 2011). As such, depending on which one of the two effects dominates, subsidiary leverage could either increase or decrease.

The second reason is to be found in the observation that despite being increasingly widespread, only a few studies analyse the effect of thin capitalisation rules on the capital structure of firms. This is particularly puzzling since limitations to interest deductibility are, as noted in the first section of Chapter 2, one of the least radical ways of reducing the debt bias and may even have the added benefit of limiting the tax planning opportunities of multinational entities (International Monetary Fund; 2016). Within the few studies focusing on the topic, the one that served as an inspiration for this study is surely that of Buettner et al. (2012). This work , focusing on the foreign subsidiaries of German multinationals in 36 countries over the period 1996-2004, studies the effect of host thin capitalisation rules (of the fixed debt equity type) on the leverage of their sample (Buettner et a.; 2012). They find that, for daughters of German companies, limitations to the deductibility of interest expenses in the host country leads to reduction in the use of internal debt financing in the group and also in the debt-equity ratio of the subsidiary (Buettner et a.; 2012). This discovery, while implying a reduction in the use of tax planning strategies by multinational groups, also suggest an increased reliance on the use of external debt for financing purposes (Buettner et al.; 2012).

Considering the previous discussion, the dissertation aims to shed light on the following issues. Firstly, in line with what is done by Miniaci et al. (2011), it attempts provide further evidence of the debt shifting activities of multinationals by looking at the changes in subsidiary leverage as a result of increases in the CIT rate and of the presence of thin capitalisation rules in the home country.

Secondly, it should contribute to the existent literature by assessing the effect exercised by the presence of thin capitalisation rules in the *home* country of the group on the capital

structure of Italian subsidiaries, something that to the best of my knowledge has not been attempted before.

As such, it should help provide a clearest picture of the impacts that changes to the tax system (in terms of corporate income tax rate and thin capitalisation rules) on the debt shifting behaviours of multinational firms.

2. The Sample

This work makes use of secondary data collected from a variety of sources. Firm characteristics have been obtained in their totality from the ORBIS database, a source of financial information on millions of companies and entities belonging to several jurisdictions. The relevant subsample of firm-specific information comprises entities that satisfy the following four main criteria: i) they are active, ii) they are publicly listed or limited liability companies, iii) they belong to the manufacturing sector, and iv) they are European subsidiaries of foreign multinationals. Considering this last point, similarly to what is done in Hiuzinga et al. (2006) and Miniaci et al. (2011), a subsidiary is defined as a firm where at least half of the shares are held by another European entity. Such a decision is related to the fact that lower ownership of shares, regardless of whether it is direct or not, might not have any influence on capital structure and leverage decisions (Mintz and Weichenrieder; 2005). According to these criteria, the final selection amounts to a set of about 78000 European subsidiaries. This set is then further reduced to investigate the research question detailed in the previous section of this chapter. In particular, two other selections are carried out. Firstly, all subsidiaries located outside of Italy are dropped from the sample. Lastly, only those companies having a mother located in one of the following ten economies are kept in the sample: Belgium, China, Germany, France, Italy, Luxemburg, Japan, the United States, the United Kingdom and the Netherlands. These countries have been chosen to obtain the final sample for the analysis because they are the one where, given the selection criteria employed, the number of Italian subsidiaries owned exceeds the threshold of one percent. The only exception to the rule is the inclusion of Belgium, that is one of the other few European countries that is implementing an allowance for corporate equity. The others two that still implement an ACE nowadays – Cyprus and Lichtenstein – are home to too few parents of Italian subsidiaries to be included. The final sample attained from the selection hereby described ultimately comprises about 20000 entities.

Macroeconomic variables, on the other hand, are derived from the World Bank's World Development Indicator. Corporate income tax rates and other tax related variables (such as the presence of thin capitalisation rules or other types of limitations to interest deductibility) are collected from three different sources: i) Ernst and Young's Tax and Legal Guides , ii) the Taxes in Europe Database by the European Commission, and iii) the PwC Worldwide Tax Summaries. More precisely, while for European countries the Taxes in Europe Database

of the European Commission has been an invaluable source for information concerning the corporate income tax rates and the characteristics of the tax systems of interest. For the three non-European countries and, more generally, for information regarding the thin capitalisation rules and limits to the deductibility of interest expenses the use of the tax reports made by consultancy networks has been instrumental. With the exception of the data coming from ORBIS that has been collected following the specific criteria listed above, all macroeconomic and tax related information have been obtained in connection to the jurisdictions housing the parent of the Italian subsidiaries and, as such, relate to the ten countries listed above.

All data relates to the period spanning from 2013 to 2020. The rationale for this choice is related to two main factors. The first is that the data available in ORBIS only spans the period from 2013 to 2022. The second is that the years 2021 and 2022 presents considerable missing information, especially for what concerns the data used to build the ratios necessary for the investigation of the research question, and as such have considerably less observation than those available for all other years. For this reason, 2021 and 2022 had to be excluded from the sample.

3. Variables Description and Descriptive Statistics

The dependent variable employed for the analysis is leverage. As defined by Rose and Hudgins (2012), "financial leverage refers to the use of debt in the hope that the borrower can generate enough earnings that exceed the cost of debt, thereby increasing potential returns to a business firm's owners".

Leverage is hereby proxied by two different measures. The first is the ratio of total liabilities to total assets since, as shown by Rajan and Zingales (1995), it represents the residuals claim to shareholders in the event of a liquidation. Alternatively, this measure of leverage – also known as the debt ratio – shows the proportion of total assets financed by debt (Frova and Hillier et al.; 2018). The decision to use the debt ratio as a proxy for leverage has ultimately been informed by its widespread use in the literature. Examples of studies employing it include but are not limited to Kühnhausen et al. (2014), Degryse et al. (2012), Hebous and Ruf (2017), and aus dem Moore (2014).

The other proxy for leverage is the debt-equity (or D/E) ratio defined as total liabilities over shareholders equity (Brigham and Houston; 2010). This ratio measures how much of the operations of the entity are financed by debt rather than equity and ultimately determines the extent to which shareholders' equity could satisfy the outstanding obligations of the company if it were necessary to do so (Gibson; 2009). It implies that "the smaller the debt-equity ratio, the better the company's ability to survive in poor conditions" (Tahu and Susilo; 2017). This ratio is less widely employed than the other in the literature investigating the debt bias and multinationals' tax avoidance behaviours. However, it is still employed in studies analysing the determinates of the capital structure (like Tahu and Susilo; 2017), and as such it will be employed to estimate an alternative specification.

As for the independent variables they may be grouped into three different categories: firm characteristics, macroeconomic variables, and tax related variables.

1. Firm Characteristics

Tangibility is the ratio of tangible fixed assets to total assets. Its inclusion as an explanatory variable is justified by its established role as a determinant of leverage. Tangibility is considered to be a proxy for the amount of collateral held corporation and, as such, it should be positively related to leverage as it reduced credit risk and the cost related to bankruptcy

(Kühnhausen et al.; 2014 and Degryse et al.; 2012). This relationship is implied by both the trade-off and the pecking order theory (Kühnhausen et al.; 2014). Despite being mostly confirmed by both theory and empirical papers, such as those of De Jong (2008), Sogorb-Mira (2005), and Hall et al. (2004), the positive association between leverage and tangibility is not always found. In particular, de Haas and Peeters (2006) note that the sign of this variable is determined by the type of tangible assets that is employed by a firm. For instance, assets that are more firm-specific generally have a low liquidation cost and as such not as easy to pledge as other kinds of assets that are much less specific (Worthington; 1995). This means that, if the tangible fixed assets of the firm are specific to that entity or particular industry, tangibility might turn negative. However, it must be noted that in general a negative relationship between the tangibility and leverage is most often observed in emerging and transition economies, rather than more developed ones due to more pervasive legal deficiencies (de Haas and Peeters; 2006). For instance, tangibility has been found to have a negative sign by Booth et al. (2001) in their study of firms' capital structure that focused on developing countries. For transition economies (Czech Republic and Hungary), a similar outcome is observed by Jelic et al. (1999).

Profitability is the ratio of earnings before interest, depreciation and amortization (EBITDA) to total assets. The rationale behind its employment is that corporations that are profitable pre-tax should have more internal funds are their disposal for investment and, thus, use less debt as a result. This will be especially true if informational asymmetries are large since, due to the difficulties in discriminating between bad and good borrowers, the cost of debt might be higher (de Haas and Peeters; 2006). Conversely, smaller less profitable firms that are more cash constrained will be forced to use debt regardless of its cost for lack of cheaper alternatives (de Haas and Peeters; 2006). While this explanation suggests a positive relationship between profitability and leverage, this is not always confirmed by theory (Kühnhausen et al.; 2014). The trade-off theory, in fact, is rather ambiguous on the relationship between the two (Kühnhausen et al.; 2014 and Degryse et al.; 2012). In particular, profitability might be expected to raise leverage if one considers that profitable firms are in better position to leverage up and better take advantage of the tax shield offered by debt (de Haas and Peeters; 2006). This is also implied by Jensen (1986), that notes that, in order to restrict managers discretion in the use of internal funds to their own personal benefit, shareholders might force them to rely on debt.

Asset Size is the natural logarithm of total assets. Total Assets has been considered in the literature to be an inverse substitute for bankruptcy costs since larger firms are less volatile, more diversified across industries and sectors, and more entrenched in their markets (Fama and French; 2002). Furthermore, bankruptcy costs that are fixed as a share of firm value will be smaller in larger entities implying as a result a lower cost of debt financing (Titman and Wessels; 1988). As such, the trade-off theory would suggest that there exists a positive relationship between assets size and leverage because firm that are larger (i.e. that have more assets) are generally less likely to fail and have a lower cost of debt capital (Degryse et al.; 2012). This is also confirmed by the theories focusing on informational imperfections. The rationale behind this is that larger firms should be more transparent to investor than smaller one and, all else being equal, they should also have an easier access to external sources of funding than their smaller (and often more opaque) counterparts (Degryse et al.; 2012, and de Haas and Peeters; 2006).

Size is the natural logarithm of the number of employees and may be considered a proxy of the size of the firm as in Karlsson (2021). Aa noted by the same author in its 2021 work, the use of the numbers of employees to proxy for size is preferred to the use of other alternatives – such as value added or sales- because of its consistency across both time and industries (Karlsson; 2021). Differently from the other variables that have been employed in the capital structure literature, size serves more the function of a control variable (such as the macroeconomic variables included in the next paragraph). Regardless of this fact, it is still included in this section because it is a firm characteristic.

 2. Macroeconomic and Country-Specific Variables

Time-varying macroeconomic factors are controlled for through the inclusion of few country-specific variables.

Gross Domestic Product (GDP) is logarithm of the annual GDP in US dollars. This is included because of the relevance of business cycle considerations for the determination of the capital structure (Kühnhausen et al.; 2014). In particular, when the economy is growing, access to debt capital is easier and the asset pledged as a collateral rise in their value. Conversely, in there is a recession or a downturn, the situation reverses (Kühnhausen et al.; 2014). This seems to imply that the relationship between growth and leverage is positive, but

it is not always the case. In fact, during economic booms, companies become more profitable. Thus, their abundant internal funds should reduce their reliance on external financing -both debt and equity (Kühnhausen et al.; 2014). This also extends to firms that have in general a less easy access to equity finance (Whited and Wu; 2006). As such, the relationship between GDP and Leverage is not always so clear-cut.

Inflation is proxied by the logarithm of the annual change in consumer prices. This is also relevant to the determination of the capital structure because of two main factors. Firstly, the higher the inflation the lower the value of debt (in relative terms). Secondly, rising inflation increases the value of the tax shield of debt (Kühnhausen et al.; 2014). As such, in general, the relationship between the two should be positive, and indeed this is what Frank and Goyal (2009) and Köksal et al. (2013) find.

Interest Rate is proxied by the lending interest rate. Such a variable is included because changes in lending rates have the chance of increasing or lowering firm incentives to borrow. For instance, the higher rates usually deter companies from increasing their amount of leverage (Antoniou et al; 2002). This specific variable is also employed by Hebous and Ruf (2017).

Similar to Hebous and Ruf (2017) this work also to control for the stability of an economy. Two main variables are used for this purpose. The first is **Political Stability** is proxied by the estimate of the political stability index indicator developed by World Bank as part of its World Governance Indicators. A higher value of such an index indicates a more stable government (Hebous and Ruf; 2017). The second, on the other hand, is **Interest Payments**. This is the logarithm of the interest payments made every year by the country of interest. So, in a way, it is a proxy of the level of indebtedness of the country. These are relevant due to the influence that the quality of political, financial, and legal institutions exerts on capital structure decision (Gungoraydinoglu and Öztekin; 2011). In particular, institutional effectiveness has a modulating influence on a series of costs that imposed on entities – such as agency costs, and informational or other kind of imperfection. This is why some observe that, the determination of a company's financing decisions is not only the result of firm specific characteristics but also of their cultural and institutional setting (Gungoraydinoglu and Öztekin; 2011). In general, however, the exact impact these exert on leverage is not easy to pinpoint.

3. Tax Related Variables

The **Corporate Income Tax (CIT)** rate is the main variable employed in the investigation of the research question. This, as already mentioned in the first section of this chapter, has been found in the literature to effect Leverage in an ambiguous way depending on the specific debt shifting and tax avoidance dynamics taking place in the multinational group. In particular, while it is true that most of the relevant literature finds that an increase in the CIT rate in the country where the parent company is located should be expected to disincentivise increases in subsidiary leverage – especially an allowance for corporate equity is implemented in the country hosting the entity – as a consequence of the increased value of interest deductibility (Huizinga et al.; 2006), this is not always the case. In fact, as noted by Miniaci et al. (2011), there exists some specific conditions under which Leverage might be expected to increase (as already detailed in the previous section).

Table 4 below summarises the information hereby provided. What is important to note is that, the thin capitalisation dummy and the interaction term are not included in this section since they are described within the presentation of the model in Section 4 of this Chapter.

Table 4: Summary of Variables' Descriptions

Summary of Variables Description

Variable	Description	Source
Dependent		
Leverage (Debt Ratio)	Total Liabilities/Total Assets	ORBIS Database
Leverage (D/E Ratio)	Total Liabilities/Total Shareholders' Equity	ORBIS Database
Firm Specific		
Tangibility	Tangible Fixed Assets/Total Assets	ORBIS Database
Profitability	EBITDA/Total Assets	ORBIS Database
Asset Size	Natural logarithm of Total Assets	ORBIS Database
Size	Natural logarithm of Number of Employees	ORBIS Database
Country Specific (Controls)		
GDP	Natural logarithm of the annual Gross Domestic Product	World Bank World's Development Indexes
Inflation	Natural logarithm of the annual change in consumer prices	World Bank World's Development Indexes
Interest Rate	Lending Interest Rate (%)	World Bank World's Development Indexes
Political Stability	Estimate of the Political Stability Index	World Bank's Worldwide Governance Indicators
Interest Payments	Natural logarithm of the country's Interest Payments	World Bank World's Development Indexes
Tax Variables		
CIT rate	Corporate Income Tax Rate	European Commissions' Taxes in Europe Database and PwC Taxation Summaries

Notes: all variables have been obtained for the period 2013-2020 for the 10 countries of interest. The only exception is represented by firm specific data that is attained for European companies and only subsequently restricted to the 10 of interest.

4. The Model

Before proceeding with the investigation of the research question an appropriate quantitative model must first be developed. In particular, this dissertation employs a regression analysis to study the relationship between subsidiaries' leverage and some of the variables that could be expected to affect the level of indebtedness of the parent company – the corporate income tax rate and the presence of thin capitalisation (debt-equity) rules (or similar limitations to the interest deductibility). The method of estimation utilised is the Ordinary Least Squares (OLS). Attributed to Gauss, the OLS method is widely employed due to its attractive features (Gujarati and Porter; 2017). In particular, this quantitative methodology is quite intuitive and it is not too cumbersome from a mathematical standpoint. In fact, the OLS determines the parameters of the regression that minimise the square of the residuals – that are square of the difference between the population regression function and the sample regression function for each unit of the sample (Gujarati and Porter; 2017). For the sample detailed above, a unit is an Italian subsidiary i having a parent company locating in country c at time t. The analysis will also employ clustrering to compute the standard errors. Such a practice, developed by Liang and Zeger (1986) and Arellano (1987), is most often used when geographical units are concerned (Abadie and Athey; 2017). However, clustered standard errors are not only employed when states or countries are concerned. Their purpose is that of addressing the correlation that might possibly affect the standard errors due to a variety of effects (Hebous and Ruf; 2017). Within this work, clustering is employed because of the design of the exercise. In particular, we cluster for country and year because the "treatment" – the CIT rate and the presence of thin capitalisation rules – differentiate the Italian affiliates along these two dimensions (Abadie and Athey; 2017). Additionally, we also cluster by individual unit, because the "treatment" is not assigned at the individual level (Abadie and Athey; 2017).

The baseline regression is specified as follows

$$Leverage_{it} = \alpha_0 + \alpha_1 CIT_{ct} + \alpha_2 ThinCap_{ct} + \alpha_3 CIT_{ct} X\ ThinCap_{ct} + \beta F_{ict} + \varphi M_{ct} + \varepsilon_{it} \ (1)$$

where $Leverage_{it}$ is either the debt ratio or the debt-equity (D/E) ratio of the Italian subsidiary i in year t depending on the specification employed. CIT_{ct} is the corporate income tax rate in the jurisdiction of the parent company c in year t. $ThinCap_{ct}$ is the thin capitalisation dummy. This dichotomous variable is defined as in (2).

$$ThinCap_{pt} = \begin{cases} 1 \ if \ the \ the \ country \ has \ a \ fixed \ debt - equity \ rule \\ 0 \ otherwise \end{cases} \quad (2)$$

In particular, it takes a value of one if the home country of the multinational group c has a limitation to interest deductibility[12] that is defined by a debt to equity rule in year t, and zero otherwise. $CIT_{ct} X \ ThinCap_{ct}$ is the interaction between the corporate income tax rate and the thin capitalisation rules in country c at time t. Firm specific and control (macroeconomic) variables are respectively represented by the explanatory vectors F_{ict} and M_{ict}. The first comprises tangibility, profitability, asset size, size and firm growth. The second includes the following country specific variables: GDP, inflation, interest rate, political stability index and interest payments for the Italian subsidiary i having a parent company located in country c in year t.

The sing taken by each of the parameters for the relevant tax variables will depend on the mechanisms that are at play, but may be summarised as follows:

The **Corporate Income Tax (CIT) rate** will be negative if an increase in the CIT rate in the home country of the group, due to increased tax shield of debt benefits, disincentivises lending to the Italian subsidiary. Conversely, if the mechanism observed by Miniaci et al. (2011) is noted, subsidiary leverage might be expected to increase. This is due to the division of debt within the group after the increase in the leverage of the parent (Miniaci et. al; 2011).

The effect of the **Thin Capitalisation Dummy (ThinCap)** might also go both way depending on the dynamic that is envisaged. In particular, since thin capitalisation rules and other similar limitation to interest deductibility reduce the asymmetric treatment of equity and debt by disallowing the deduction of interest expenses beyond a certain threshold (that

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[12] This is regardless of whether the country explicitly defines the rule as a thin capitalization rule or simply as a limitation to interest deductibility. For the purpose of this work such a distinction is irrelevant.

for the purpose of this study is expressed in terms of a fixed debt-to-equity rule), one could expect their presence in the home country to increase the leverage of the subsidiary. Such an outcome results from the fact that, with thin capitalisation rules, increasing indebtedness beyond a certain threshold is not as beneficial as it was before (International Monetary Fund; 2016). However, a mechanism similar to that envisaged by Miniaci et al. (2011) for the CIT rate, might also apply here. This means that thin capitalisation rules might negatively affect the leverage of the subsidiary if they lower the indebtedness of the parent in a significant way due to the division of debt within the group. This is something that is demonstrated in a different setting by Buettner et al. (2012). In fact, the authors find that thin capitalisation rules (of the same type analysed in this work) are liable to reduced internal debt, and that this is not perfectly substituted for by external debt, thus decreasing group leverage (Buettner et al.; 2012).

Lastly, the sign of the **Interaction (CIT X ThinCap)** between the corporate income tax rate and the thin capitalisation dummy illustrates the mediating effect of the limitations to interest deductibility on the incentives to use internal debt (Buettner et al.; 2012). As such, its impact on leverage may go either way. For example, if the interaction positively affects subsidiary indebtedness, the finding could possibly be explained by stating that thin capitalisation rules reduce the tax shield of debt provided to the parent, thus encouraging the group to increase indebtedness in the subsidiary where doing so is more beneficial. Conversely, if thin capitalisation rules reduce the tax advantage of the use of intra-group debt (as the work of Buettner et al.; 2012) suggests, and this effect might be strong enough to potentially reduce the benefits coming from increase indebtedness in the parent, then affiliate leverage might also be reduced as a result.

5. Limitations of the Study

The limitations of the study are mostly related to the data employed. The following drawbacks might be identified:

- ORBIS only includes observations spanning from 2013 to 2022. The time period, as noted in the description of the sample, has also further been shortened by two year (only keeping information up to 2020). This means that over the period not many changes to the thin capitalisation rules are observed for the sample. Although, some changes do take place. This means that any finding obtained from the employment of the thin capitalisation dummy would have probably benefitted from a longer time period. This is not too big of a concern for the corporate income tax rates, since they have been modified at least once by almost all countries included in the sample.

- The dataset does not include any information about the parent company beyond its location. This is an issued because the availability of firm specific information concerning the parent of the group would have greatly improved the estimation of the regression.

- For the purpose of this study, only Italian subsidiaries are observed. This has two main consequences. The first is that Italian companies, if they satisfy the condition for it, may have access to ACE. This means that, when evaluating the results, we must be mindful that the allowance for corporate equity is also at play. Secondly, the tax minimisation and debt shifting dynamics cannot be observed in full because the full ownership structure of the parent is not observed.

Another relevant limitation that does not concern the data is the observation made by de Mooij (2011) and others (such as Mintz and Weichenrieder; 2010) that leverage might be non-linear in corporate income tax rate. This would imply that the responsiveness of indebtedness to taxes is increasing with the corporate income tax rate (de Mooij; 2011). Considering this, using the ordinary least square method for estimating the regression might not be appropriate to fully capture the effect of corporate taxation on subsidiaries' leverage.

IV.   Empirical Results

This chapter presents the results of the estimation procedure attempting to investigate the research question – the assessment of the impact that specific changes to the tax system of the home country have on the level of indebtedness of Italian subsidiaries. This should allow for the identification of whether cross-country differences in corporate income taxes and in the presence of thin capitalisation rules affect the indebtedness of the affiliates located in Italy. Thus, possibly shedding light on the effect of the asymmetric treatment of equity and debt on debt shifting behaviours among multinationals groups.

The chapter is organised as follows. Section 1 presents a description of the statistical properties and of the correlation of the data. Section 2, on the other hand, illustrates the results obtained for the regressions estimated. Overall, the regression employed is always the same, what changes is the underlying sample. In fact, inference is first carried out over the whole sample in the baseline regression. Subsequently, the sample is modified and split in several ways. In Regression 2 and 3 the subsidiaries owned by Italian and Belgian companies, and Chinese, Japanese and American enterprises are respectively dropped from the sample. Conversely, in Regression 4 and 5 the sample is split by the median Size of the affiliates. Lastly, to investigate more closely the findings of Miniaci et al. (2011), enterprises are classified according to their Profitability in Regression 6 and 7. For ease of interpretation all results are presented in tabular form.

The estimation of the regressions, as well as any other operation carried out with the data (including the steps detailed in the previous chapter to obtain the "final" sample) , employs STATA as its statistical software.

1. Descriptive Statistics

Table 5 below provides a summary of the descriptive statistics of the variables relevant to the investigation of the research question. These statistics are included for the purpose of summarising the main characteristics and information of the sample data that is employed for the analysis (Hand; 2008). To this purpose, the table presents two measure of central tendency and a few measures of spread. Concerning the first category, the mean and the median are employed as the main measures of location to describe the central tendency of the variables (Hand; 2008). Their informative nature is then improved by including the following measures of dispersion or spread: standard deviation, the range and the quartiles. These are useful in understanding how the data is distributed around its mean, thus allowing for a quantification of its dispersion (Hand; 2008).

For completeness, a correlation analysis is also carried out. This has as its aim the quantification of the degree of linear association among the variables of interest, thus allowing the exclusion of those variables that are excessively (positively or negatively) correlated with each other (Gujarati and Porter; 2017). The reason behind this procedure is that the OLS method of estimation rests on the assumption that there is no multicollinearity between the regressors. If multicollinearity is present and one or more regressors is a perfect of less than perfect combination of the other regressors then the precision of the estimation of the parameters of the regression is called into question (Gujarati and Porter; 2017). There is not an exact definition of what constitutes a high correlation, thus for the purpose of this work all variables with a correlation coefficient higher than 0.80 will be excluded. Interest Payments is disregarded as a result. Table 6 presents the results of the correlation analysis.

Table 5: Descriptive Statistics

	Mean	**SD**	**p25**	**Median**	**p75**	**Range**
			Summary statistics			
Leverage (Debt Ratio)	1.451	30.767	0.000	.104	.56	3827.569
Leverage (Debt Equity Ratio)	.745	8.787	0.000	.063	.544	1936.5
Tangibility	.71	.308	0.508	.836	.971	1.117
Total Assets	7.701	2.196	6.342	7.782	9.123	16.488
Size	3.626	1.372	2.708	3.555	4.431	10.52
Profitability	5.121	95.522	0.069	.29	.919	7738.051
GDP	28.447	.873	28.267	28.329	28.402	5.877
Inflation	-.542	1.2	-1.423	.129	.204	4.347
Interest Payments	2.048	.507	2.086	2.179	2.317	2.759
Interest Rate	3.052	1.548	2.603	3.001	4.129	6
Political Stability Index	.445	.239	0.342	.404	.458	1.99
CIT	.258	.041	0.240	.25	.275	.24
ThinCap Dummy	.082	.274	0.000	0	0	1

Notes: the descriptive statistics are obtained for all the variables relevant to the regression for the period 2013-2020 for the Italian Subsidiaries having a parent in the following ten countries: Belgium, China, Germany, France; Italy, Japan, Luxembourg, the Netherlands, the United Kingdom, and the United States.

SD is the standard deviation and p25 and p75 are respectively the 25th and 75th percentile.

Table 6: Correlation Matrix

Correlation Matrix

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Leverage (Debt Ratio)	1.000										
(2) Leverage (Debt Equity Ratio)	0.047	1.000									
(3) Tangibility	-0.004	-0.017	1.000								
(4) Asset Size	-0.107	-0.028	-0.061	1.000							
(5) Size	-0.049	-0.036	-0.048	0.763	1.000						
(6) Profitability	0.032	-0.001	-0.024	-0.123	-0.060	1.000					
(7) GDP	-0.033	-0.029	-0.008	0.039	0.086	0.012	1.000				
(8) Inflation	-0.015	-0.020	-0.012	0.089	0.094	-0.013	0.142	1.000			
(9) Interest Payments	-0.012	0.031	0.011	-0.085	-0.114	0.002	0.550	-0.157	1.000		
(10) Interest Rate	0.003	0.047	0.012	-0.083	-0.137	-0.001	0.310	-0.277	0.803	1.000	
(11) Political Stability Index	0.021	0.003	-0.022	0.071	0.069	-0.002	-0.551	0.060	-0.683	-0.365	1.000

Notes: the descriptive statistics are obtained for all the variables relevant to the regression for the period 2013-2020 for the Italian Subsidiaries having a parent in the following ten countries: Belgium, China, Germany, France; Italy, Japan, Luxembourg, the Netherlands, the United Kingdom, and the United States.

54

2. Empirical Results

1. *Results: Baseline Regression*

The Baseline Regression is estimated using the full sample – all Italian subsidiaries whit a parent company in the one of the following ten countries: Belgium, China, Germany, France, Italy, Japan, Luxembourg, the Netherlands, the United Kingdom, and the United States – and is composed of a total of about 20000 observations. All the regressions – in column (1) to (4)- employ the Debt ratio as a proxy for Leverage.

Focusing on tax related variables, whose impact on subsidiaries' leverage is the topic of the investigation, it may be observed that the corporate income tax rate is positive and always not significant across all columns. Despite non being significant, the direction of this effect conforms to the observation made by Miniaci et. al (2011). In particular, one can observe that increasing the corporate tax rate of the parent company increases the indebtedness of the subsidiary suggesting that subsidiary leverage might be driven also by debt "sharing" consideration within the group. The thin capitalisation dummy (ThinCap), on the other hand is negative and significant (even if often weakly so) in all regressions, even those with clustered standard errors. This suggest that, keeping all else fixed, Italian subsidiaries whose parent is subject to thin capitalisation rules (of the fixed debt-equity ratio kind) experiences a decrease in Leverage of about 5.34 thousand of US dollars. Such an effect might be explained using a rationale similar to that of Miniaci et al. (2011). Having thin capitalisation rules in the home country of the group disincentivises increases in the indebtedness of the parent company by disallowing interest deduction beyond a certain threshold (expressed in terms of D/E ratio). As such, it may be envisaged that a reduction in the indebtedness of the mother may spill over to the rest of the group due to dynamics of division of debt.

Conversely, the interaction term is positive and significant in all column but the third - the one with clusterisation by home country. The direction of this impact possibly suggests that the reduction in indebtedness resulting from the presence of thin capitalisation (fixed debt-to-equity) rules is offset by the increase in debt generated by an increment in the corporate income tax rate. As already mentioned, the significance of the effects is overall confirmed by columns (2) to (4) where standard errors are clustered respectively by year and parent country, and by the affiliate. This procedure allows for the correction of correlation that

might possibly be present in the error terms as a result of year, parent country or affiliate effects (Hebous and Ruf; 2017).

Table 7: Estimation of the Baseline Regression

Dependent	Leverage (Debt Ratio)			
Baseline Regression				
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	-.398	-.398	-.398	-.398
	(.298)	(.293)	(.318)	(.344)
Asset Size	-.967***	-.967**	-.967***	-.967***
	(.065)	(.288)	(.225)	(.241)
Size	.739***	.739**	.739**	.739***
	(.102)	(.27)	(.234)	(.244)
Profitability	.003**	.003*	.003	.003
	(.001)	(.001)	(.002)	(.003)
Macroeconomic (Control) Variables				
GDP	-.337***	-.337*	-.337***	-.337**
	(.118)	(.166)	(.039)	(.17)
Inflation	.03	.03	.03	.03
	(.084)	(.058)	(.047)	(.071)
Interest Rate	.201**	.201***	.201***	.201**
	(.078)	(.055)	(.043)	(.08)
Political Stability	.846*	.846	.846**	.846
	(.478)	(.706)	(.371)	(.809)
Tax Related Variables				
CIT	1.543	1.543	1.543	1.543
	(2.491)	(1.176)	(1.318)	(1.227)
ThinCap Dummy	-5.337**	-5.337*	-5.337*	-5.337**
	(2.655)	(2.685)	(2.869)	(2.64)
Interaction	21.06**	21.06	21.06*	21.06*
	(9.578)	(11.239)	(10.642)	(10.976)
Constant	14.45***	14.45**	14.45***	14.45***
	(3.376)	(5.153)	(1.328)	(4.969)
Observations	19970	19970	19970	19970
R-squared	.016	.016	.016	.016
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** p < 0.01; ** p < 0.05, and p < 0.1. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

2. Results: Exclusion of ACE Countries

Differently from the baseline regression, Regression 2 uses as a sample the Italian subsidiaries with a parent that is located in a country with no allowance for corporate equity. This implies the exclusion of all those affiliates having Italian and Belgian parents. This is carried out to rule out possible confounding behaviours that might result from the possibility that parents (and not only Italian subsidiaries) may take advantage of an allowance for corporate equity themselves. However, as might be noted in Table 8, the numbers of observations in the sample is greatly reduced (from about 20000 to 6000) since many Italian subsidiaries are actually owned by Italian companies.

The results presented in the table below do not differ in a substantial way from those obtained utilising the full sample. In fact, looking at regression from (1) to (4) we can note that, similarly to what is obtained for the baseline regression, the corporate income tax rate remains insignificant independently of the clusterisation of standard errors. However, what also loses significance at the exclusion of subsidiaries owned by Italian and Belgian parents, at least for what concerns columns (1) and (2), are the thin capitalisation dummy and the interaction term. These two variables, however, remain weakly significant when the standard errors of the regression are clustered by home country and affiliate company. This means that some evidence of a thin capitalisation driven reductions in the use of internal debt in the multinational group cannot be ruled out completely in this sample. What cannot also be excluded is the fact that, even in this instance, the interaction term hints at the fact that the increase in the CIT rate might be able to offset the decrease in group indebtedness, and as a result that of the affiliate, that originates from the presence of limitations to the deductibility of interest expenses.

Overall, in terms of magnitude and direction of these effects, the estimates provided by column (1) to (3) do not differ too significantly from those of their respective baseline specification. The estimates are slightly larger than obtained before.

Table 8: Estimation of Regression 2 (excluding ACE countries)

Regression 2				
Dependent	**Leverage (Debt Ratio)**			
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	-.602	-.602	-.602	-.602
	(.792)	(.558)	(.668)	(.71)
Asset Size	-1.138***	-1.138	-1.138	-1.138*
	(.185)	(.703)	(.713)	(.688)
Size	1.048***	1.048	1.048	1.048
	(.289)	(.786)	(.754)	(.767)
Profitability	.001	.001	.001	.001
	(.003)	(.004)	(.004)	(.003)
Macroeconomic (Control) Variables				
GDP	-.444	-.444	-.444***	-.444
	(.309)	(.525)	(.092)	(.53)
Inflation	.15	.15	.15	.15
	(.347)	(.24)	(.246)	(.2)
Interest Rate	.223	.223	.223	.223
	(.22)	(.36)	(.144)	(.368)
Political Stability	.689	.689	.689	.689
	(.966)	(.565)	(.401)	(.705)
Tax Related Variables				
CIT	1.764	1.764	1.764	1.764
	(4.002)	(1.333)	(1.469)	(1.443)
ThinCap Dummy	-6.869	-6.869	-6.869*	-6.869*
	(4.514)	(3.772)	(3.324)	(3.913)
Interaction	26.438	26.438	26.438*	26.438*
	(16.591)	(14.168)	(12.04)	(14.709)
Constant	17.875*	17.875	17.875***	17.875
	(9.249)	(16.781)	(4.909)	(16.814)
Observations	6208	6208	6208	6208
R-squared	.009	.009	.009	.009
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** p < 0.01; ** p < 0.05, and p < 0.1. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

3. Regression 3 (excusing only non-European countries)

Regression 3 employs as a sample only countries belonging to Europe excluding, as a result, Chinese, Japanese and American parents of Italian subsidiaries. In this case the sample still include a quite large number of observation (17000) and is utilised to investigate if there are dynamics among the variables that are peculiar to Europe or, more precisely, to the specific subset of European countries employed.

Table 9 illustrates the results. Concerning tax related variables, the first thing that may be observed is that, while having magnitudes that are much larger than those previously identified, the direction of the estimated effect is in line with both the baseline and regression 2. In particular, the results suggest that, when looking at this set European countries, increases in the corporate income tax rate of the parent company rise indebtedness in the subsidiary (as observed by Miniaci et al; 2011). This may possibly result from division of debt between the different entities that compose the multinational group (Miniaci et al.; 2011). Such an impact, however, is not significant for any of the regressions estimated regardless of the employment of clusterisation.

Conversely, thin capitalisation rules are found to reduce subsidiary leverage of about 18 thousand of US dollars across all regressions estimated when affiliates with a parent located China, Japan and the United States are dropped from the sample. The significance of these estimates, however, disappears once standard errors are clustered by year, parent's country, and affiliate.

The same exact behaviour may also be observed for the interaction term. In fact, this is only significant in column (1). The interaction term is found to be positive in all regression conveying the idea that, when the sample only comprises subsidiaries of European parents, the presence of thin capitalisation rules reduces the tax shield of debt in the home country making it more attractive to raise leverage in the host one. The magnitude of this effect, as noted above, is also much greater (it is more than double in fact) than that attained for the baseline regression.

Table 9: Estimation of Regression 2 (excluding non-European Countries)

Regression 3

Dependent	Leverage (Debt Ratio)			
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	-.224	-.224	-.224	-.224
	(.351)	(.458)	(.385)	(.484)
Asset Size	-1.094***	-1.094**	-1.094***	-1.094***
	(.075)	(.334)	(.277)	(.282)
Size	.795***	.795**	.795**	.795***
	(.117)	(.293)	(.283)	(.266)
Profitability	.004**	.004*	.004*	.004
	(.001)	(.002)	(.002)	(.004)
Macroeconomic (Control) Variables				
GDP	-.686	-.686	-.686	-.686
	(.449)	(.975)	(.668)	(1.148)
Inflation	.051	.051	.051	.051
	(.099)	(.034)	(.06)	(.068)
Interest Rate	.112	.112	.112	.112
	(.122)	(.096)	(.084)	(.135)
Political Stability	1.808**	1.808**	1.808***	1.808**
	(.808)	(.566)	(.428)	(.776)
Tax Related Variables				
CIT	6.268	6.268	6.268	6.268
	(6.679)	(6.534)	(6.007)	(8.803)
ThinCap Dummy	-18.112**	-18.112	-18.112	-18.112
	(9.169)	(16.237)	(16.256)	(18.985)
Interaction	57.926**	57.926	57.926	57.926
	(29.037)	(52.834)	(51.646)	(60.874)
Constant	23.7*	23.7	23.7	23.7
	(13.724)	(29.573)	(20.202)	(34.443)
Observations	17232	17232	17232	17232
R-squared	.017	.017	.017	.017
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** $p < 0.01$; ** $p < 0.05$, and $p < 0.1$. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

4. Regression 4 and 5: Classification of Firms by Size

To investigate whether the impact of changes in the parent corporate income tax rate and thin capitalization differ depending on the size of the subsidiary, the sample is split into two according to the median size of the Italian affiliates. A subsidiary is defined as Large if its size exceeds the median size of the entities in the sample. Conversely, it will belong to the category of Small companies if its size is lower or equal to the median size of the subsidiaries that compose the sample. As shown in table 10 and 11, the number of entities falling in the Large and in the Small category is of respectively 11000 and 9000. Both of them are quite numerous and evenly distributed, so issues related to micronumerosity should be of no concern.

Table 10 illustrates the results for entities categorized as Large. As might be noted, to the exclusion of column (1) where both the ThinCap Dummy and the Interaction term are highly significant, all tax related variable are found to be of no significance. This holds independently of the type of clusterisation that is carried out. Overall, the direction of the tax variables agree with those of the other specifications. The magnitude of the estimates, on the other hand, is much smaller. Starting from the CIT rate, this is positive, suggesting the presence of the debt division mechanism observed by Miniaci et al. (2011), but not significant. Concerning the ThinCap Dummy and its Interaction with the CIT rate, the direction of the effect is reminiscent of that found in table 7, 8 and 9. ThinCap is in fact positive. This suggests that the presence of thin capitalization rules in the parent country lowers the tax shield provided by debt thus increasing affiliates indebtedness. Moving to the interaction term, the sign is negative. This finding as already noted in the section related to the baseline regression, might be explained by noting that even if the corporate income tax rate increases, the presence of thin capitalization rules in the home country might reduce the incentives to the use of internal debt. This implies that both parent and affiliate indebtedness might fall as a result.

Moving now onto table 11, the results for size Small are presented. Looking at the tax related variables, it might be clearly seen that the corporate income tax rate is positive but insignificant also for this sample of affiliates with size smaller than the median one. Conversely, the presence of thin capitalization rules is found to decrease the leverage of Italian subsidiaries of about 12 thousand of US dollars. This effect is weakly significant across

column (1) and (2), but it disappears once standard errors are clustered by home country (i.e. the country where the parent of the subsidiary is located). Lastly, the interaction term is found to be significant across all regression, even if it is only weakly so when clustering is introduced. Differently from the Size Large subset, the magnitude of the estimations obtained with firms of a smaller-than-median size are much closer to those obtained in the other specifications. This might possibly suggest that Large companies are less sensitive to changes in the tax related variables.

Table 10: Estimation of Regression 2 (size Large)

Regression 4

Dependent	Leverage (Debt Ratio)			
	(1)	(2)	(3)	(4)
Tax Related Variables				
Tangibility	-.061***	-.061**	-.061***	-.061*
	(.018)	(.022)	(.017)	(.036)
Asset Size	-.116***	-.116***	-.116***	-.116***
	(.006)	(.009)	(.018)	(.012)
Size	.089***	.089***	.089**	.089***
	(.007)	(.011)	(.028)	(.012)
Profitability	.043***	.043***	.043*	.043**
	(.006)	(.005)	(.02)	(.019)
Macroeconomic (Control) Variables				
GDP	-.101***	-.101***	-.101***	-.101***
	(.007)	(.012)	(.029)	(.011)
Inflation	-.002	-.002	-.002	-.002
	(.005)	(.008)	(.014)	(.004)
Interest Rate	.05***	.05***	.05***	.05***
	(.005)	(.011)	(.012)	(.006)
Political Stability	-.181***	-.181**	-.181***	-.181***
	(.029)	(.068)	(.053)	(.05)
Tax Related Variables				
CIT	.2	.2	.2	.2
	(.146)	(.288)	(.34)	(.149)
ThinCap Dummy	.495***	.495	.495	.495*
	(.157)	(.266)	(.395)	(.271)
Interaction	-1.873***	-1.873	-1.873	-1.873**
	(.571)	(1.029)	(1.458)	(.919)
Constant	3.862***	3.862***	3.862***	3.862***
	(.201)	(.326)	(.792)	(.338)
Observations	11272	11272	11272	11272
R-squared	.075	.075	.075	.075
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** $p < 0.01$; ** $p < 0.05$, and $p < 0.1$. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

Table 11: Estimation of Regression 2 (size Small)

Regression 5

Dependent	Leverage (Debt Ratio)			
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	-.111	-.111	-.111	-.111
	(.704)	(.906)	(.757)	(.92)
Asset Size	-2.178***	-2.178**	-2.178***	-2.178***
	(.173)	(.69)	(.588)	(.6)
Size	.901***	.901*	.901*	.901**
	(.249)	(.406)	(.486)	(.44)
Profitability	0	0	0	0
	(.002)	(.001)	(.002)	(.002)
Macroeconomic (Control) Variables				
GDP	-1.016***	-1.016	-1.016***	-1.016
	(.301)	(.625)	(.182)	(.654)
Inflation	.109	.109	.109	.109
	(.187)	(.14)	(.12)	(.175)
Interest Rate	.413**	.413***	.413***	.413**
	(.186)	(.117)	(.12)	(.179)
Political Stability	2.24*	2.24	2.24**	2.24
	(1.159)	(1.867)	(.951)	(2.215)
Tax Related Variables				
CIT	4.046	4.046	4.046	4.046
	(6.28)	(3.569)	(3.056)	(4.017)
ThinCap Dummy	-12.439*	-12.439*	-12.439	-12.439**
	(6.67)	(5.679)	(7.084)	(5.03)
Interaction	49.661**	49.661*	49.661*	49.661**
	(23.68)	(23.619)	(25.658)	(20.917)
Constant	38.257***	38.257*	38.257***	38.257**
	(8.596)	(18.371)	(6.458)	(18.392)
Observations	8698	8698	8698	8698
R-squared	.024	.024	.024	.024
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** p < 0.01; ** p < 0.05, and p < 0.1. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

4. Regression 6 and 7: Classification of Firms by Profitability

Lastly, since Miniaci et al. (2011) find that an increase in the corporate income tax rate of the parent company raises the leverage of profitable subsidiaries, this work also analysis the research question by dividing the sample in two groups of firms – those that have a high profitability and those that have a low one. High profitability is defined as firms with a profitability strictly higher than the median. While those with a low profitability have values for this variable that are either smaller or equal to the 50th percentile. Overall, the observation are evenly distributed among the two categories. "High" and "Low Profitability" firms are in fact characterized by approximately 10.000 observations each.

Table 12. presents the estimation results for the "High Profitability" sample. Focusing on column (1) to (4), the CIT rate and the ThinCap Dummy are insignificant and the direction of the affect is respectively positive and negative – a finding that is customary to all regressions analyzed up to this moment. The interaction term, on the other hand, is found to be positive and of weak significance in three of the four regressions (number (1), (2), and (3)). Significance disappears only when clustering by year.

Table 13, on the other hand, illustrates the estimates obtained for "Low Profitability" firms. As might be noted, independently of the whether clusterisation is employed, no tax related variable is significant. However, the use of this specific sample of firms produces and outcome that has not been observed anywhere else in this thesis – the CIT rate is negative rather than positive. The direction of this effect suggests that, for low profitability firms the dynamic behind the capital structure decision of the multinational group might be the more "traditional"[13] one. This means that subsidiary leverage decreases because the increase in corporate income tax rate in the home country raises the incentives to leverage the parent up.

So, it may be concluded that, as far as this specific sample of Italian affiliates is considered, the effect appreciated by Miniaci et. al (2011) is not observed. In fact, even when classifying the sample by Profitability, the corporate income tax rate is found to be insignificant (even

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[13] Intended as most often observed in the literature.

if the direction of the impact in High Profitability firms is in line with that noted by the authors). However, what must also be stated is that Miniaci et al. (2011) find that increasing the CIT rate in the home country rises indebtedness in the affiliate companies when two conditions are satisfied at the same time: i) the subsidiaries are profitable, and ii) the parent is located in a high tax country. This second requirement is not controlled for in any of the regression presented below.

Table 12: Estimation of Regression 2 (High Profitability)

	Regression 6			
Dependent	Leverage (Debt Ratio)			
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	.12	.12	.12	.12
	(.605)	(.88)	(.705)	(.833)
Asset Size	-1.567***	-1.567**	-1.567**	-1.567***
	(.136)	(.573)	(.487)	(.478)
Size	1.198***	1.198*	1.198*	1.198**
	(.212)	(.556)	(.533)	(.493)
Profitability	.001	.001	.001	.001
	(.002)	(.001)	(.002)	(.002)
Macroeconomic (Control) Variables				
GDP	-.64***	-.64	-.64***	-.64*
	(.23)	(.39)	(.089)	(.389)
Inflation	.044	.044	.044	.044
	(.162)	(.112)	(.088)	(.139)
Interest Rate	.286*	.286**	.286***	.286*
	(.152)	(.105)	(.076)	(.15)
Political Stability	1.397	1.397	1.397*	1.397
	(.92)	(1.408)	(.685)	(1.54)
Tax Related Variables				
CIT	2.606	2.606	2.606	2.606
	(4.808)	(2.169)	(2.013)	(2.46)
ThinCap Dummy	-7.962	-7.962	-7.962	-7.962**
	(5.08)	(4.203)	(4.719)	(4.01)
Interaction	32.237*	32.237	32.237*	32.237*
	(18.229)	(18.047)	(17.184)	(16.797)
Constant	24.554***	24.554*	24.554***	24.554**
	(6.533)	(11.428)	(3.238)	(10.99)
Observations	10263	10263	10263	10263
R-squared	.019	.019	.019	.019
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** $p < 0.01$; ** $p < 0.05$, and $p < 0.1$. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

Table 13:Estimation of Regression 2 (Low Profitability)

Regression 7

Dependent	Leverage (Debt Ratio)			
	(1)	(2)	(3)	(4)
Firm Specific Variables				
Tangibility	-.242***	-.242**	-.242***	-.242***
	(.058)	(.07)	(.049)	(.064)
Asset Size	-.3***	-.3***	-.3***	-.3***
	(.015)	(.054)	(.056)	(.042)
Size	.246***	.246***	.246***	.246***
	(.02)	(.046)	(.049)	(.039)
Profitability	-.007***	-.007	-.007**	-.007
	(.002)	(.006)	(.002)	(.009)
Macroeconomic (Control) Variables				
GDP	-.124***	-.124***	-.124***	-.124***
	(.024)	(.018)	(.027)	(.025)
Inflation	.016	.016	.016*	.016
	(.017)	(.019)	(.009)	(.018)
Interest Rate	.105***	.105***	.105***	.105***
	(.016)	(.014)	(.011)	(.015)
Political Stability	.207**	.207	.207**	.207*
	(.097)	(.148)	(.086)	(.122)
Tax Related Variables				
CIT	-.12	-.12	-.12	-.12
	(.501)	(.284)	(.273)	(.292)
ThinCap Dummy	-.845	-.845	-.845	-.845*
	(.542)	(.503)	(.809)	(.475)
Interaction	2.966	2.966	2.966	2.966
	(1.966)	(1.998)	(2.897)	(1.871)
Constant	5.47***	5.47***	5.47***	5.47***
	(.682)	(.716)	(.756)	(.798)
Observations	9707	9707	9707	9707
R-squared	.059	.059	.059	.059
Cluster (year)		yes		
Cluster (parent country)			yes	
Cluster (affiliate)				yes

Notes: the significance level are sketched as follows *** $p < 0.01$; ** $p < 0.05$, and $p < 0.1$. Column (1) to (4) use the Debt Ratio as a dependent variable. In column (2) to (3) the standard errors are clustered by year, parent country, and affiliate respectively. A detailed description of all the variables is presented in Chapter 3 (see Table 5 for a summary). Standard errors are in parentheses.

V.   Summary of the Main Findings and Discussion of the Results

This section provides a brief summary of the main findings that may be derived from the estimation procedure carried out above.

1.   Tax Related Variables

The **Corporate Income Tax** rate is found to be positive but insignificant across all different samples employed in the analysis. This suggest that, while it might be true that subsidiary leverage is positively impacted by the increase in the corporate income tax rate in the home country due to debt divisions dynamics in the group (as observed by Miniaci et al.; 2011), such an impact is never significant, not even when the sample is split by median Profitability. Importantly, however, since Miniaci et. al (2011) observe such a positive impact on highly profitable affiliates with a parent located in a high tax country, controlling for whether the parent is in a high or low tax country could have possibly produced different results.

The **ThinCap Dummy** is found to be negative in almost all samples considered. This result is somewhat counterintuitive. In fact, one could expect the presence of thin capitalisation rules to decrease the benefit of leveraging up in the home country by limiting the deductibility of interest expenses (European Commission; 2016). This is turn should make increasing the indebtedness of the subsidiaries much more attractive. However, thin capitalisation rules might decrease subsidiaries' leverage if they lower the use of internal debt financing. This is in line with the finding by Buettner et al. (2012)[14] that thin capitalisation rules might result in an imperfect substitution of internal with external debt that triggers a decline in group leverage.

The estimated impact of thin capitalisation dummy is significant – even if often only weakly- for several of the samples employed. For the baseline regression, in particular, the significance of the effect is reduced but does not disappear with clustered standard errors. This provides some evidence in support of the reduction in the group's overall level of internal debt that is detailed above, possibly suggesting that home country thin capitalisation rules might be effective in reducing the debt bias also in the subsidiary on top of reducing

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[14] It must be remembered that the authors use a setting that is the opposite of that employed in this thesis. They look at the effect that taxation and thin capitalization rules in the *host* country have on the indebtedness of both foreign German subsidiaries and their parent.

tax planning opportunities for multinationals. However, for the other subsamples employed (such as those in regression 3, 4 and 5), the significance often disappears when the standard errors are clustered by year or parent country.

Lastly, the **Interaction** between the CIT rate and the ThinCap Dummy positively affects leverage in (almost) all of the data samples considered. This result is sensible because it suggests that, by reducing the tax incentives of rising leverage in the home country it becomes more attractive to raise debt in the affiliate. Such an effect is usually quite sizable and is sometimes found to be significant, even if often only when the standard errors are not clustered. This suggests that such a mechanism might also be at play across the sample.

As might be understood, the results of the analysis may only suggest the existence of a certain association or dynamic among the variables. This means that, even if no causal relationship among the variables may be established, this exercise is still helpful shedding light on the effect that the asymmetric treatment of debt and equity exercises on the leverage of Italian subsidiaries through debt shifting. In particular, considering that the Interaction term and the ThinCap Dummy significantly affect the leverage of the affiliates in some instances, the mechanisms outlined above cannot be ruled out completely.

What must also be stated is that the investigation would probably have benefitted a lot from the introduction of information about the parent company. This would have allowed for a more precise investigation of the mechanisms at play behind the effects outlined above. If possible, further research should undertake this endeavour to shed light on the debt shifting and tax planning opportunities originating from the asymmetric treatment of debt and equity. Additionally, as already mentioned before, the corporate income tax rate might affect leverage in a non-linear way (de Mooij; 2011). If this is the case then, the use of the OLS estimation method might not be appropriate and my fail to fully capture the dynamics that tax related variables exercise on the indebtedness of Italian subsidiaries.

2. Firm Specific Variables

Despite not being the objective of the investigation, a few words must also be spent on the other variables that are part of the regression. As such the focus of this section will be on those firm specific variables that are found to determine the capital structure in the literature. Country specific variables, on the other hand, are included to control for those macroeconomic factors that might affect the financing decision of firms. For this reason, their effect of the capital structure is hereby disregarded from this discussion.

Overall, all firm specific variables – Tangibility, Asset Size, Size, and Profitability – are often found to be significant. Some exceptions are sometimes represented by Tangibility and Profitability that are not always significant at conventional level. The direction of these effects is generally constant across all sample employed.

Tangibility exercises a negative impact on Leverage, but such an effect is only significant in "Large" and "Low Profitability" affiliates (as exemplified by Regression 4 and 7). This possibly suggest that, the firms belonging to these two subsets, are embedded with specific fixed assets that have a low liquidation value (Worthington; 1995).

Total Asset is always negative and significant. This finding is puzzling since theory would imply the opposite. In particular, as noted in the description of the variables presented in Chapter 3, larger firms should be more transparent than their smaller counterparts and, as such, they should have and easier and cheaper access to credit (Degryse et al.; 2012, and de Haas and Peeters; 2006). Even if this finding is difficult to explain, a similar effect has been observed before in other studies such as Rajan and Zingales (1995); and Onofrei et al. (2015) among others. This confirms that there is still a lot that is not known about the determinants of the capital structure.

Size as proxied by the log of the number of employees is also positive and significant. This result is in line with the literature for reasons that are not dissimilar to those applying to Total Assets.

Lastly, **Profitability** is found to negatively affect leverage for almost all samples employed. This conforms to the pecking order theory that suggests that firms that are more profitable are better able to rely on internal rather than external funds (Titman and Wessels; 1988).

VI. Conclusions

Most tax systems around the world favour the use of debt over that of equity by allowing the deduction of interest expenses from the imposable tax base. The reasons for the asymmetric treatment of these two sources of financing is actually difficult to justify from both a legal and economic perspective, and capital structure theories are still unable to provide a compelling explanation to this tax systems' feature (de Mooij; 2011a).

The tax deductibility of interest expenses is not free from consequences. In fact, this generates two main adverse impacts (International Monetary Fund; 2016). The first is the creation of a debt bias that contributes to increasing leverage to excessive levels, thus presenting a risk not only to the survival of individual entities but also for the stability of the macroeconomy and the financial system (aus dem Moore; 2014). Further, through differences cross-country corporate income tax rates, the asymmetric treatment of debt and equity increases the debt shifting and tax planning opportunities of multinationals with considerable fiscal revenues implications for states (European Commission; 2016).

Several solutions have been proposed to make tax systems more neutral, but those that enjoyed more success are surely the allowance for corporate equity and thin capitalisation rules. Concerning the first, while having been applied in just a few states and often only for a limited period of time, ACE has generally been able to achieve its objective of reducing firms' indebtedness (Zangari; 2014). Thin capitalisation rules and other limitations to the deductibility of interests, on the other hand, represent a much less "radical" modification to the fiscal legislation and, for this reason, have enjoyed a more widespread application than that of any alternative measure (Buettner; 2014). Despite their extensive use around the world, the effect of thin capitalisation rules has not been investigate by many studies. They are supposed to reduce (not to eliminate) the debt bias and, depending on the specific design of the measure, they could be effective also in reducing the debt shifting opportunities for multinational groups (International Monetary Fund; 2016).

Against this background the empirical analysis presented in this thesis proposes to investigate the impact of cross-country differences and in the presence of thin capitalisation (fixed debt-equity) rules in the home country of a multinational group on the leverage of Italian subsidiaries. While not establishing a causal relationship among affiliate indebtedness and tax related variables, the dissertation still contributes to improving the understanding of the capital structure impacts of debt shifting dynamics in multinational groups. In particular, the ordinary least squares estimation produces the following results.

Despite never being significant, the corporate income tax rate is always positive. Suggesting that for the samples employed the dynamic observed by Miniaci et al. (2011) might be at play. This means that, increases in the corporate income tax in the home country might increase subsidiaries' leverage because the rise in the indebtedness of the parent is then divided among the entities making up the group. The only instance where the direction of the effect differ is when only firm with a "Low Profitability" are considered. This suggests that, for this specific set of corporations, the more "traditional" dynamic might be at play – leverage in the affiliate is decreases because, when the CIT rate in home country rises, increasing parent's debt becomes attractive.

Moving to the effect of thin capitalisation rules (proxied by a thin capitalisation dummy), these are found to reduce subsidiary leverage across all samples and, sometimes, in a significant way. Thus, it may be envisages that the presence of limitation to interest deductibility reduces the use of internal debt within the group. Such an effect is confirmed in a different setting by Buettner et al. (2012).

The Interaction term always affects leverage in a positive way possibly indicating that, when the incentives to leverage up in the home country are limited, even if the corporate income tax rate increases, raising indebtedness in the affiliate becomes more attractive. Such as effect is at time significant.

This investigation is not free from limitations that should be address by further research on the topic. The quantitative analysis in fact would have benefitted from a richer dataset. Firstly, having a longer period of time would have been useful to observe more variation in both tax rates and in the use of thin capitalisation rules. Further, the inclusion of more information about the parent, such as those regarding the ownership structure, would have allowed to better reconstruct the debt shifting dynamics among the different entities of the group. Lastly, an additional issue might be related to the use of the ordinary least square approach because CIT rates have been found at times to impact leverage in a non-linear (de Mooij; 2011).

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